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EXCAVATING ENGINEER

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● Before Marines were able to plant our flag on Mt. Suribachi (pictured in above War Loan design), they encountered murderous enemy fire on the northern Iwo Jima beach shown here as a bustling vital supply center.

Official U. S. Marine Corps Photo

XXXIX May, 1945 Number 5

THAT EXTRA OUTPUT..

Wartime performance has proved the ability of Bucyrus-Erie quarry and mine excavators to deliver the EXTRA output required to meet emergency demands successfully. Like every machine in the complete line, the 2½-yard 54-B Ward-Leonard electric delivers "years ahead" performance because it is scientifically designed for the work it must do. At the right are seven of the features behind the big output owners everywhere are getting with the 54-B.

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EXCAVATING ENGINEER

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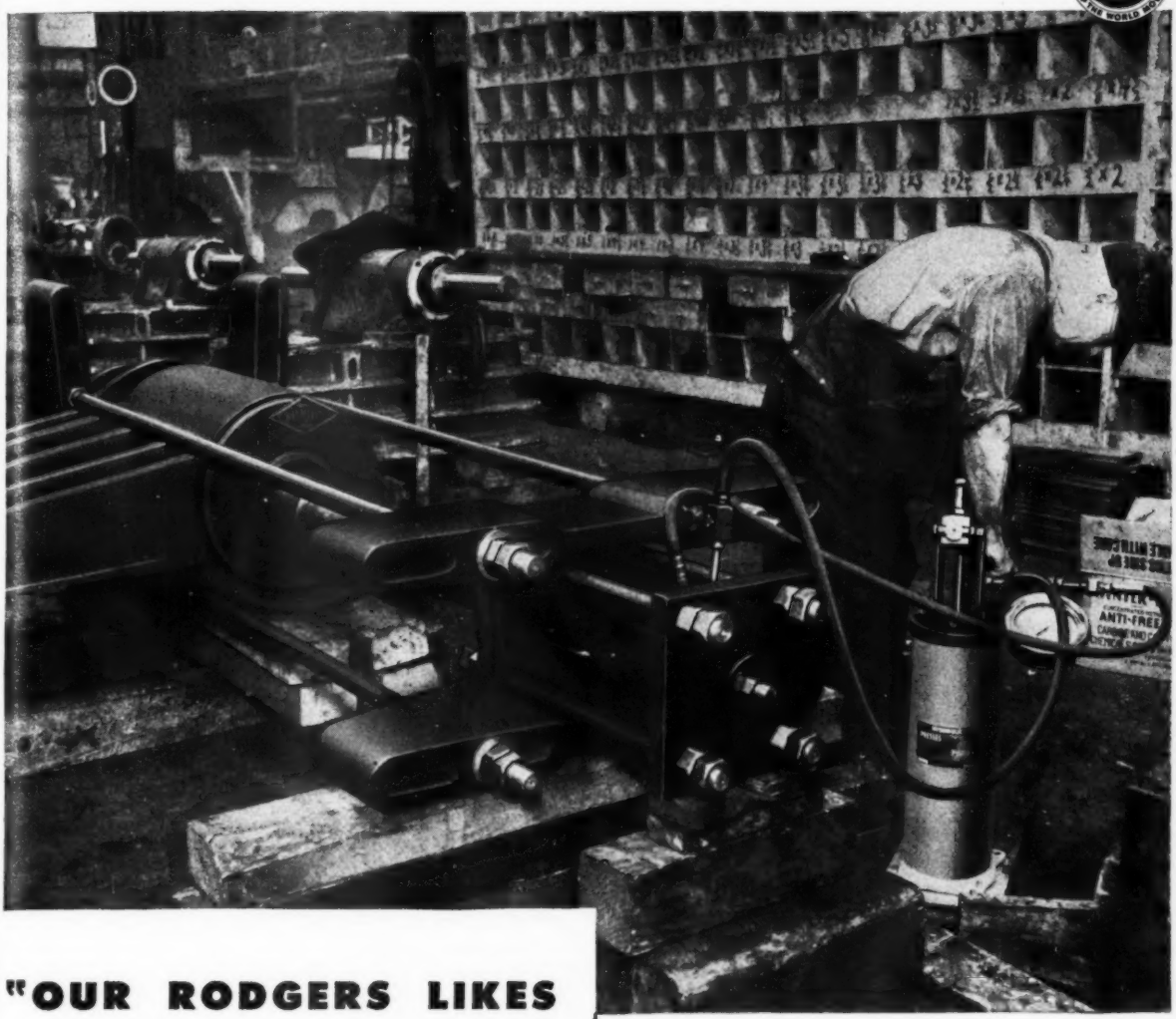

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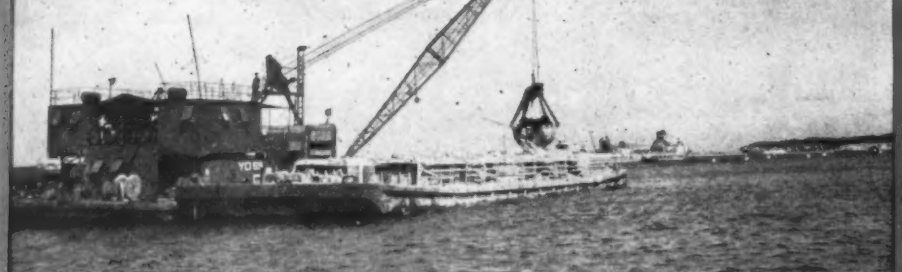


• General view of Bucyrus-Monighan 5-W equipped with a 75-ft. boom and four cu. yd. clamshell bucket and mounted on a 100'x45'x8.5' barge loading to a dump scow.

A Shift with the Wonder Boys

By R. P. DAY

DO YOU FIND YOURSELF wishing you were a Seabee? You've read colorful stories of their exploits. You heard their third birthday party aired on the blue network. Prior to the time of the Seabees, construction always struck you a lot like being stuck in a poker game. The fascination lay in sticking it out just one more pot to get even.

You wonder about this glamor in GI greens. Possibly you missed something in 30 years of booming around. And you wonder what life on a Seabee job is really like. This is as natural for a construction man as it is for a four-year old boy to dream of being a cowboy.

To prove to your complete satisfaction what it's like, we shall spend a shift with the Seabees.

We're in a Construction Battalion. You're in for the reading time of this piece. The Battalion is a big battalion composed of experienced dredgemen, clamshell operators, divers and underwater powder men. Commander F. G. Elliott, CEC, from St. Louis, Mo., is its officer in charge. Lieutenant Commander C. E. McKay, CEC, a California gold dredge man, is its executive officer. Their jobs compare with the project manager's, and the superintendent's, respectively on the kind of work you're used to.

Since you're a dirt mover, we'll hire out for eight hours on a special job the Battalion is doing in a forward harbor of the western Pacific. We're going to take a Bucyrus-Monighan 5-W machine out in the middle of the harbor, put a 4-cu. yd. clamshell bucket on it, and make it pay its way digging 80 feet under the surface of the water. That is deeper than we've ever had to go before, and the job is rushing. So we've got to get on the ball.

We board a boat to get out to the rig. It is an LCV (P), one of the small, fast wood-hulled craft powered by a 225 HP Gray marine diesel. CPO Wm. Grover, from Loomis, Calif., checks to make certain somebody brings a five-gallon can of drinking water along before he gives the coxswain the highball. Grover is in charge of this shift, assisted by stocky, ruddy-faced S. C. Riggle from Grand Coulee Dam, Wash. Riggle is an experienced high-climber, and you've already heard about the adjustments they've made on the Monighan to permit her to dig this deep. You begin to get the general idea, when you look at the faces of the other six men in this crew, that you're in familiar and competent company.

The coxswain backs the LCVP away from the pontoon landing, showering the Seabees on the stern with spray when the exhaust pipe dips under water and slobbers. There's a brisk wind today and the sun is only an hour old. It promises to be a good day. The boys tell you that sometimes it rains very hard. The normal rainfall here is 81 inches a year, but January is the first of five comparatively dry months.

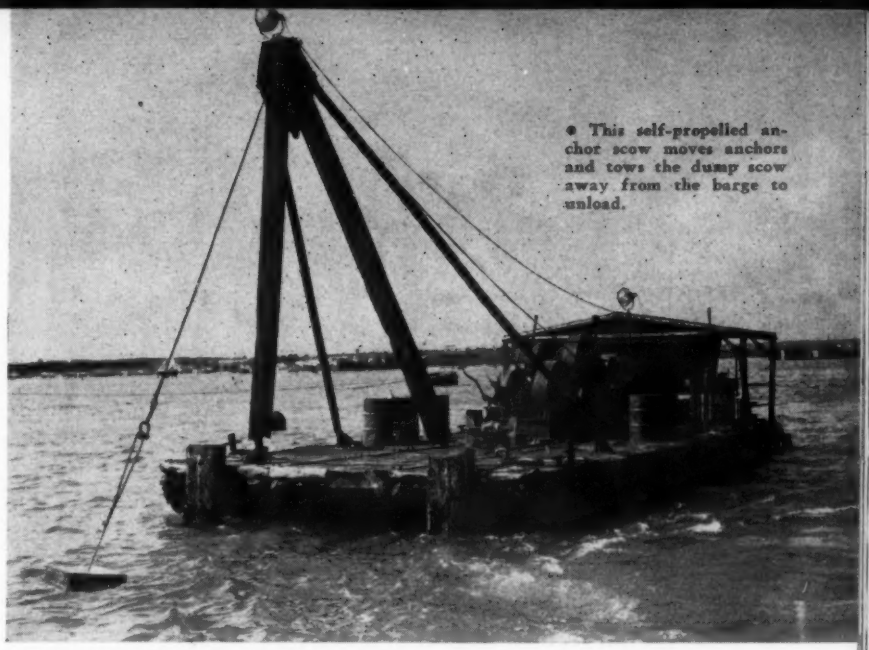
Barge Mounting

The big Monighan is hanging out in the bay on her anchors. You recognize her familiar lines: the long, nicely counterbalanced cab that takes advantage of her diesel engine's weight; the heavy, solid looking boom. You look for her round base, the rolling cams and her walking pontoons, but this machine is a special barge-mounted job and you find none of these items. She is leveled up on a fabricated base which follows the camber of the steel barge. Mounted on the 100'x45'x8½' barge, in addition to the 5W machine, is an after deck house with sleeping quarters for six men, a kitchen, toilet and winch house.

While Riggle and Grover check the 600-cu. yd. bottom door dump scow, you follow Charlie Wetherall, operator, from Huntington, W. Va. He and H. R. "Rosie" Rose, from Spokane, Wash., will check the machine over and take five minutes to grease a couple of fittings not easily accessible when the rig is running. Rosie is the oiler.

The rig is driven by a 240 horsepower 6-cylinder Fairbanks-Morse 2-

The author, R. P. Day, a Seabee, invites you to spend eight-hour shift on a barge-mounted Bucyrus-Monigh 5-W with 75-ft. boom and 14-ton four cu. yd. clamsh bucket digging a nest for a drydock in 80 feet of wate a forward harbor of the Western Pacific.



• This self-propelled anchor scow moves anchors and tows the dump scow away from the barge to unload.

cycle diesel engine. Hooked by a V-belt drive to the flywheel of this main engine is a 40 kilowatt Westinghouse generator, which delivers electric power at 250 volts throughout the machine. You notice a small Wisconsin gas engine driven Gardner-Denver air compressor and two big air tanks which start the main engine. There's an injector tester mounted on the side of the cab. Because the rig is barge-mounted and being used for clamshell work, her heavy boom is only 75 feet long.

She carries a 14-ton clamshell bucket, made by Stockton Iron Works, with four teeth on each lip. Once a shift the closing sheaves of this bucket are lubricated.

Alterations for Deep Digging

You look around at the extra work Grover and Riggle did to rig her up for this deep digging. Extra long holding and clam closing lines 500 feet in length have been installed on the big drums. They ran into a little problem with the frame which holds the tag line weight. This frame wasn't high enough to let the clamshell bucket go down 80 feet, so they had to take the top sheave and rigging out, build an extension 12 feet higher, and re-rig the tagline. Now, with the bucket down from 80 to 85 feet, the "monkey weight" which holds the clamshell bucket from swinging rises within 12 inches of the top of its cage. The extension was made out of angle iron the same size as the factory made frame. So rushing was this job that the new work wasn't painted.

Rosie gives her the air and the Fairbanks-Morse diesel takes off with a roar. You notice, when she's warming up, that No. 2 cylinder is giving off a little white smoke but the other stacks are clear the way they ought to be. Charlie Wetherall crawls up into his cab and five minutes from the time the crew you've relieved takes off in the LCVP you arrived in, you're digging.

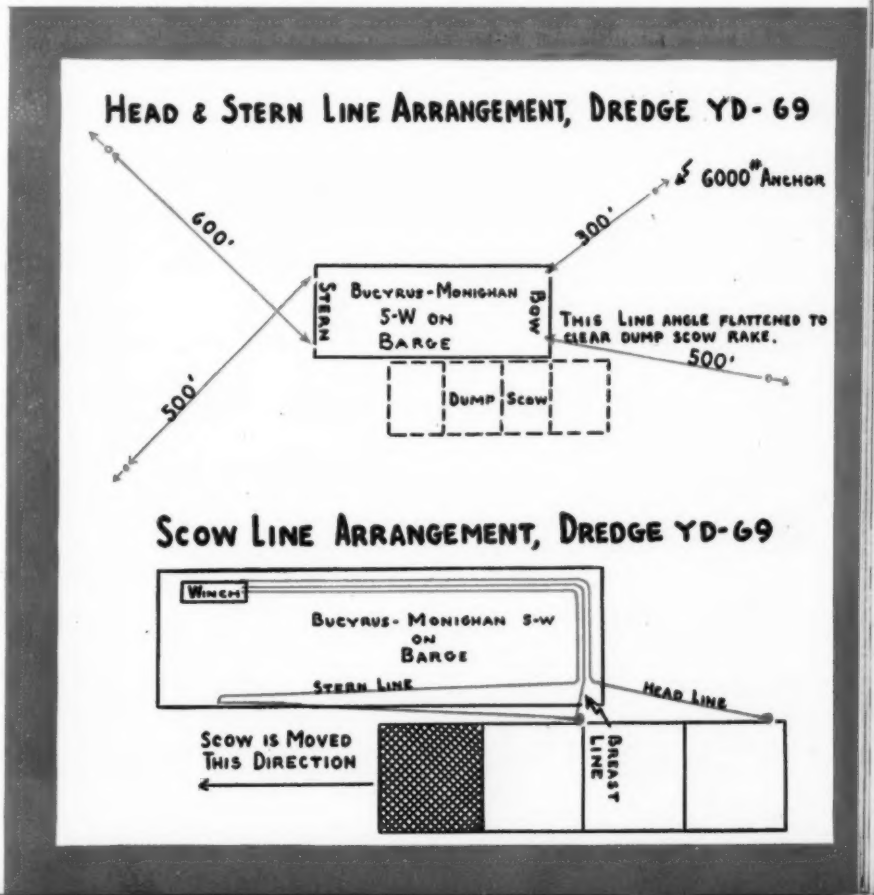
There's about 80,000 cu. yds. in this job. A hopper dredge has taken some of it out, but a mighty good share belongs to this rig. You're digging a nest for a drydock, and the water under it has to be deep enough to take almost anything.

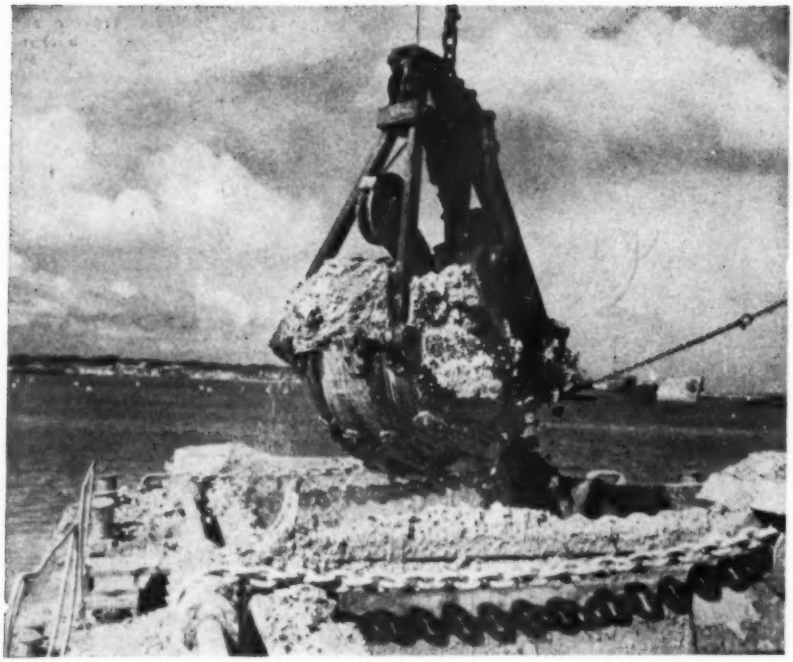
The crew takes its working station. J. H. Smith of Portland, Ore., is on the winch machinery that moves the clamshell barge east, west, north or south. L. E. Mitchell of Judsonia, Ark., tends the scow and will direct its dumping when Charlie gets her filled. C. H. Fink from Strong City, Kas., and H. J. Gallagher of Dedham, Mass., are the two deckhands. Some of these men are new, having been placed there because some of the regulars had to stay on another island where they did their last job. Being a new man, you get the idea immediately that you're not exactly one of the gang. Without anything being said in that many words, you realize that you're going to have to prove up.

The older men tell you matter-of-factly about the last job. In three months this rig increased the anchorage facilities of the harbor up at this other island from two to 16 ships. A typhoon caught the rig and slammed her up on a reef. Working day and night they got her off. But some of the aches in her joints are still being ironed out. The salt water got into some of the motors and auxiliary gas engines and raised havoc with distributors, magnetos and other fine moving parts.

Loading Scow

You're starting this shift with an empty dump scow, and this is fine because you've got a full 600 yards





• Material clammed with a 14-ton bucket with four teeth on each lip is a soft, heavy mushy coral mud weighing 3,500 lbs. per cu. yd. Note survey targets at right center of picture.

of digging ahead of you before you have an unavoidable delay. (That's what you think, at least.) You give Fink and Gallagher a hand with the manila lines that hold the scow in close to the barge, and you spot the scow in such a way that Charlie Wetherall will load the last compartment first, working her gradually back until the forward compartment is loaded the last thing. Searching for the reason behind this procedure, you see that Grover wants to keep the front end riding high as long as possible because that forward anchor line leads out mighty close to the rake of the barge.

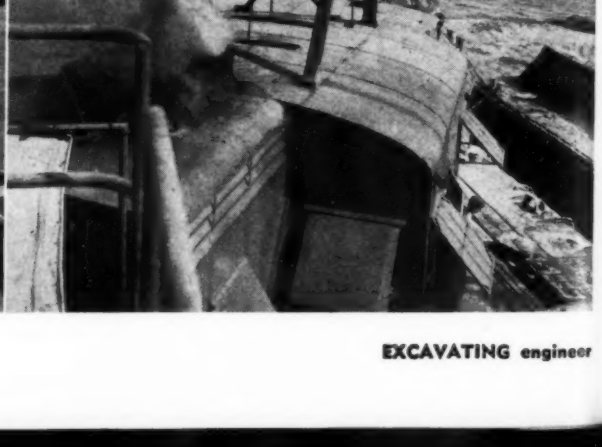
Charlie is coming up with the first bucketful. Long before it clears the water you know he's got a terrific load because the 240 horsepower diesel begins to lug down and black smoke shows in the exhaust stacks. This material is soft, heavy mushy coral mud. It weighs 3500 pounds per cu. yd. and the 4-cu. yd. clamshell bucket coming up out of the water is loaded all the way up into the dumping sheaves. You can see that six yards are coming up, easily. That makes a total weight of 24 tons per swing.

When this first bucketful dumps in the scow you understand why you aren't asked to clean the deck forward. Mud splatters all over the deck and the front of the Monighan. Later on, you will start up the pump and wash the deck down once on your shift with a 1½-inch hose. But for now you help Rosie get his cab and engine room cleaned up. You coil down some manila lines at the scow, too, and before a half hour has passed you're muddy and dirty.

Charlie Wetherall is working his head off. This bucket is plenty heavy. When he lowers it he's got to use both his holding and clam closing drum brakes to keep it from digging down too far in the mud. If he lets the bucket down too far a suction sets up and it's hard to hoist it out of there. A few weeks of idleness

(Continued on page 280)

• Below: Tag line weight frame was built up in the field by Seabees. Exhaust stacks are clear with empty bucket being lowered. Right: Exhaust pipes belch black smoke as the Bucyrus-Monighan clears the water with a heavy load.



Surplus War Equipment Disposal Plan

Power Crane and Shovel Association submits to Surplus War Property Board recommendations for disposal of new and used equipment and spare parts.

A CONCISE comprehensive program governing the disposal of new surplus power cranes and shovels, used surplus machines and surplus spare parts manufactured for military purposes was recommended by the Power Crane and Shovel Association of 74 Trinity Place, New York 6, New York.

Recommendations covering the disposal of new surplus machines are summarized in the following five-point program submitted to the Surplus Properties Board by the Association:

"1. Each power crane and shovel manufacturer would act as agent for the Treasury Department to sell new surplus machines for the Government at a predetermined price and pay for the equipment at a predetermined percentage of that price when the equipment is sold.

"2. The manufacturer would agree to sell surplus equipment at a predetermined rate of disposal based on the number of sales of new units that he is currently manufacturing and selling at the time of disposal.

"3. Prices, percentages, and rates of disposal, as well as all other conditions entering into an agency agreement between manufacturer and the Treasury Department are a matter for negotiation, and the agreement could provide for periodical adjustment of prices and rates of disposal to meet changing conditions.

"4. If a manufacturer, for any reason whatever, either declines or is not asked by Government to act as agent for the Treasury Department, surplus products of his manufacture shall be sold by the Government over a period of time designated as acceptable to the majority of power crane and shovel manufacturers.

"5. It is proposed that with respect to surplus power cranes and shovels, the agency contract provides for the sale of one Government machine to every three new machines manufactured as a minimum, with the privilege of the manufacturer selling a maximum of three government-owned machines to one new machine produced."

Disposal of Used Surplus Machines

The program for the disposal of used surplus machines is covered under the following four recommendations:

"1. Power cranes and shovels produced before January 1, 1936 should be declared unusable and sold for scrap and in such a manner that they cannot be put back to their original use or resold through trade channels.

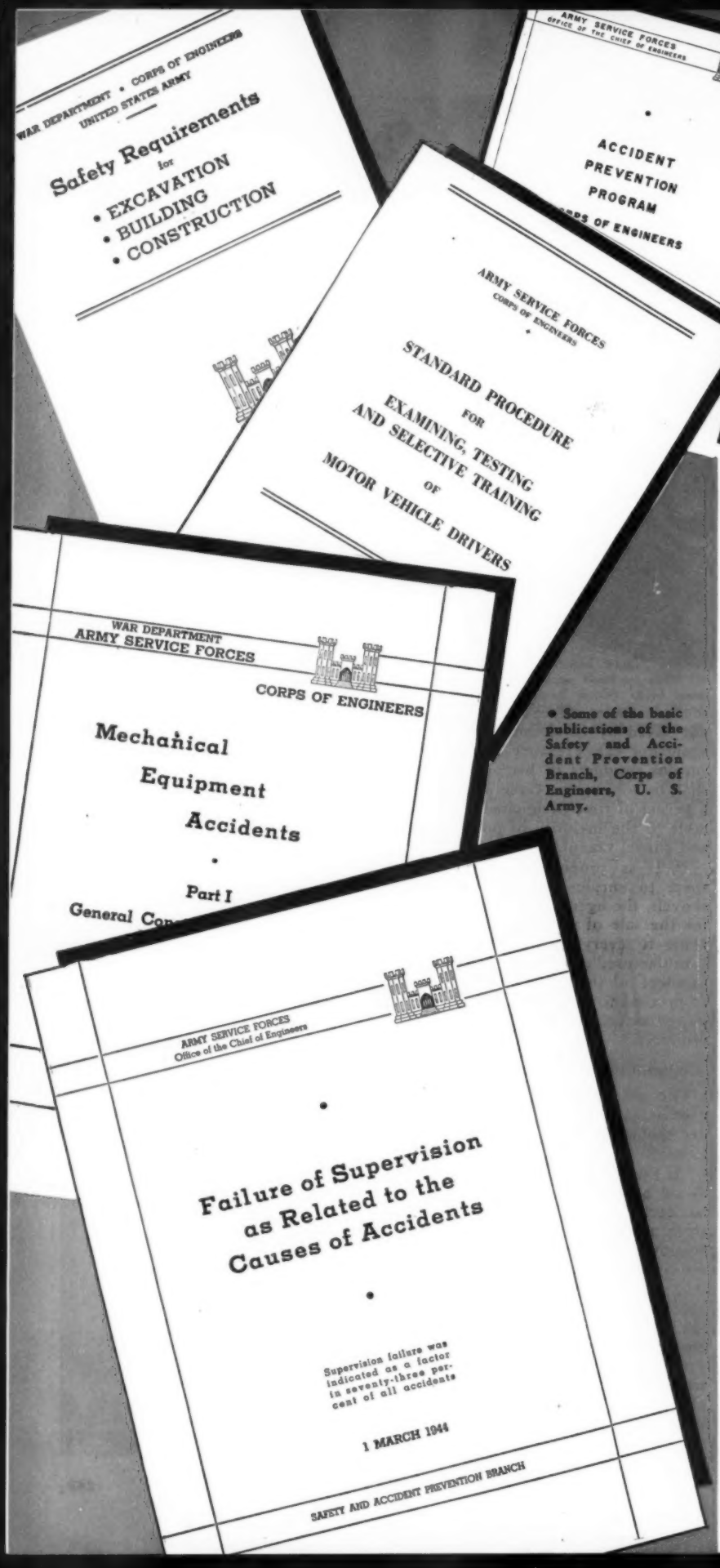
"2. It is generally agreed that manufacturers are not in a position to handle used surplus equipment. Accordingly, the sale of used surplus equipment should be confined to those who, under the provisions of the Surplus Property Act of 1944, will qualify as purchasers, preferably regularly established dealers who because of their facilities and experience are in a position to make the best possible offers to Government.

"3. As it is virtually impossible, quickly and correctly to appraise the value of all used machines, it is recommended that a devaluation formula be used to establish a floor price, below which a used machine should not be sold. It must be realized, of course, that certain used machines are in exceptionally good shape or may be equipped with new attachments and buckets or other accessories such as new light plants. Accordingly, it can be expected that offers for such machines may be considerably above the floor prices. The whole purpose of suggesting that floor prices be established, is to give Government a ready reference as to whether or not a machine should be disposed of as scrap, when no bids are being received above a predetermined minimum price.

"A suggested devaluation formula is the following:

Age of Machine	Floor Price % of original value
1 Year	45
2 Years	40
3 Years	35
4 Years	30
5 Years	25
6 Years	20
7 Years	15
8 Years	10

(Continued on page 279)



• Some of the basic publications of the Safety and Accident Prevention Branch, Corps of Engineers, U. S. Army.

ON THE BASIS OF previous records, it was presumed at the onset of the Army construction program in 1941 that the very minimum accident rate which could be expected was a frequency of 37 in 1941, 41 in 1942, and 45 in 1943. This predicted trend was based on such factors as:

1. The organization of new construction combinations purely for war construction.

2. Spreading very thinly the relatively few outstanding key construction men.

3. The intensely competitive labor market.

4. Draining of the physically fit personnel by the armed forces.

5. The utilization of thousands of contractors, large and small, most of whom neither knew, nor cared, about accident prevention.

Hence it was considered beyond any doubt that frequency and severity rates would go sky high. Certainly no one quarreled with the premise that accident rates would be no **lower** than the trend in normal or pre-war time.

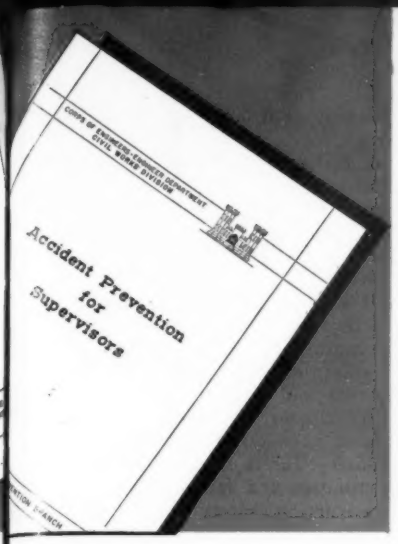
The actual results were contrary to the forecasts. For 1941 with an exposure of 866 million man-hours, the frequency rate was 26.83 and the severity 2.18; 1942 had an exposure of 1,799,000,000 and a frequency rate of 17.61 and the severity of 2.49, and in 1943 the exposure totaled 727 million man-hours and the frequency rate was 14.61 and the severity 2.89.

These results proved that construction work is just as amenable to accident prevention as are other industries. It seems essential therefore to set forth some of the elements principally responsible for their accomplishment.

First in importance is the policy of the Corps of Engineers, as follows—

UNIVERSAL SAFETY EST 1913

Based on address given at the National Safety Council's 33rd National Safety Congress.



Accident Prevention *in Postwar Construction*

Carrying out an accident prevention program consisting of 10 basic activities will enable the construction industry, through voluntary, intelligent and aggressive leadership, to establish a safety record in postwar construction that befits this great industry.

By LLOYD BLANCHARD

(Chief, Safety & Accident Prevention Branch, Corps of Engineers, U. S. Army)

"It is essential to efficient conduct of all work under the jurisdiction of the Corps of Engineers and the protection of all employees, that every practical means be utilized to eliminate or minimize all accident, fire and health hazards in its operations and that personal protective devices, equipment and apparel be provided, as the type of work exposure requires."

Steps taken in fulfillment of this policy were:

1. The development and maintenance of an accident prevention program was made mandatory as a specific contractural obligation.

2. Prime contractors were held strictly responsible for the accident experience of all subcontractors.

3. A specific, published code of safety requirements, tailored to construction work, was established and enforced.

4. Detailed reporting of individual lost time injuries on standard forms was required.

5. Monthly accident analyses were maintained for each project and corrective action taken when an unsatisfactory experience developed.

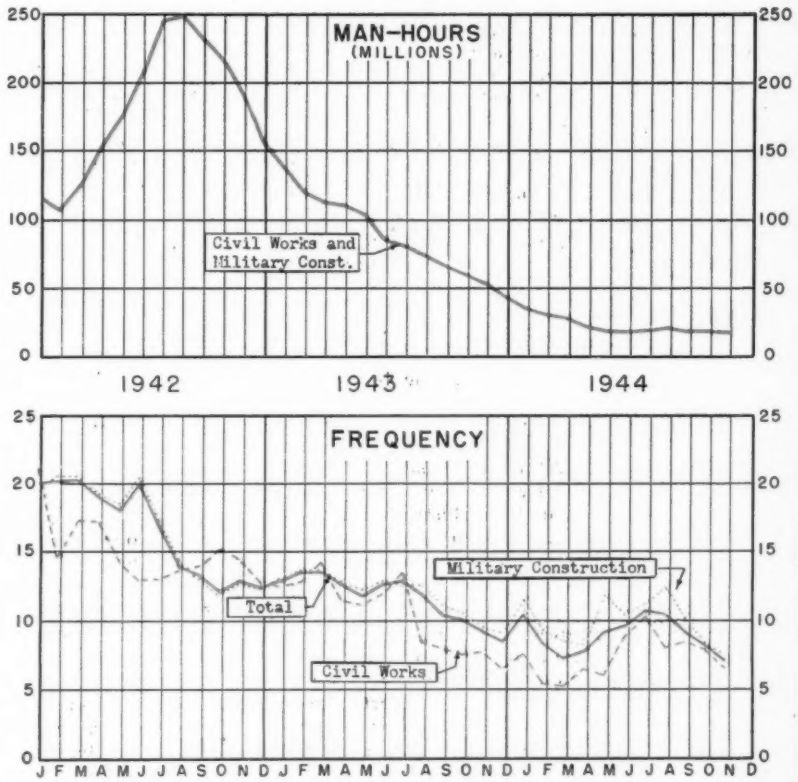
6. A full-time safety engineer was required on all projects at a certain exposure level.

7. All operations were spot checked or otherwise supervised by safety engineers of the Corps of Engineers under the direction of experienced Division and District Safety engineers qualified in accordance with high professional standards.

8. Accident prevention and safety engineering recommendations in the field were correlated with accident analyses thereby producing a balanced program.

9. Specific detailed requirements provided for adequate medical personnel to staff the required mobile

CORPS OF ENGINEERS
MAN-HOURS AND FREQUENCY RATES
FOR
CIVIL WORKS AND MILITARY CONSTRUCTION
1942-1944



SAFETY AND ACCIDENT PREVENTION BRANCH
OFFICE OF THE CHIEF OF ENGINEERS

• Discussing the improving safety record of the Corps of Engineers with Lloyd A. Blanchard, Chief, Safety and Accident Prevention Branch, are Major General Eugene Reybold (left), Chief of Engineers and Major General Thomas M. Robins (right), Deputy Chief of Engineers.

first aid field stations and the infirmaries.

10. Army and Navy "E" awards were made contingent upon the accident frequency and the severity rates of each nominee contractor being equal to or better than the Corps-wide experience for that particular class of construction.

An accident prevention program which has produced such favorable results can be applied to construction work in the postwar era with equivalent results.

There are some fundamentals that underlie construction work in normal times that must not be overlooked. Contracts will be awarded on a strictly competitive basis; the advantage of low accident costs may provide the financial difference between a successful and unsuccessful bid; low accident costs augment profits, aid in meeting completion dates, reduce equipment maintenance costs and the amount of capital invested in standby equipment, reduce casualty insurance premiums and enhance morale. All of these factors will be essential to survival in the construction business of the future.

Prevention Program

Now what constitutes the basic activities of an effective accident prevention program for the industry?

1. The industry must adopt and declare its support of a complete, realistic and affirmative policy on accident prevention.

A declaration of such policy by the general contractors of the country and enforcement upon all subcontractors would have far reaching effect and nullify the various demands for local and national legislation that is constantly being urged before legislative bodies. Most of the legislation relates to additional compensation benefits for the injured worker which can never substitute for effective accident prevention.

2. The industry must develop, adopt and comply with an adequate construction safety code.

Merely subscribing to the principles of one code or another is not sufficient. A lot has been said by industry concerning self - government. The adoption of such a voluntary code would be concrete evidence of the ability of the construction industry to self-govern.

3. It must recognize that safety engineering is an established science and that effective accident prevention cannot be achieved by assignment of that responsibility to some superannuated employee or as additional duties to that of a timekeeper, etc., or the perfunctory display of posters and distribution of pamphlets.

Safety engineering in its true application begins with the estimates, proceeds through designs and plans and into the field with operations, to the completion of the project. Not only does safety engineering embrace the protection of the worker; it also includes the prevention of damage to and destruction of materials and equipment through correction of faulty methods, practices and procedures. The solution of actual and potential accident problems in construction operations requires technical training, skill and practical experience.

4. Either within itself or at an established engineering college it should endow an institute for training construction safety engineers because of the highly specialized problems involved.

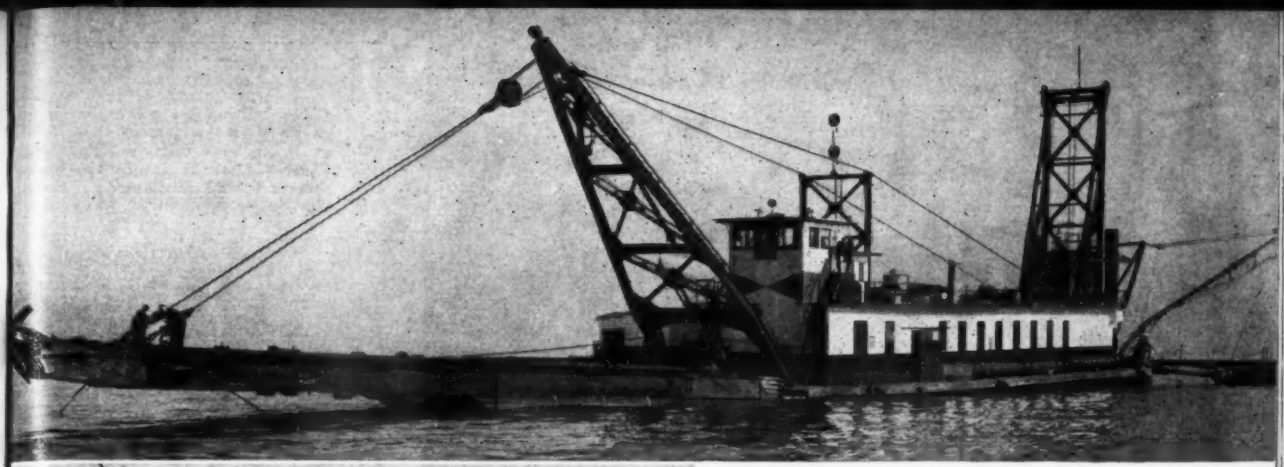
It is true no doubt that many contractors have lost faith in accident prevention and developed an aversion to safety engineers due to the incompetence and ineptness of some. To a great degree, however, this can be laid at the door of the construction industry, due to failure to provide opportunities and facilities for training construction safety engineers. This can be accomplished in various ways, underwriting a training program at a qualified technical or engineering school or college, establishment of a training institute within the A.G.C. or sponsorship of a special course in safety engineering in the curriculums of technical educational institutions. In any event the product should be qualified and competent construction safety engineers.

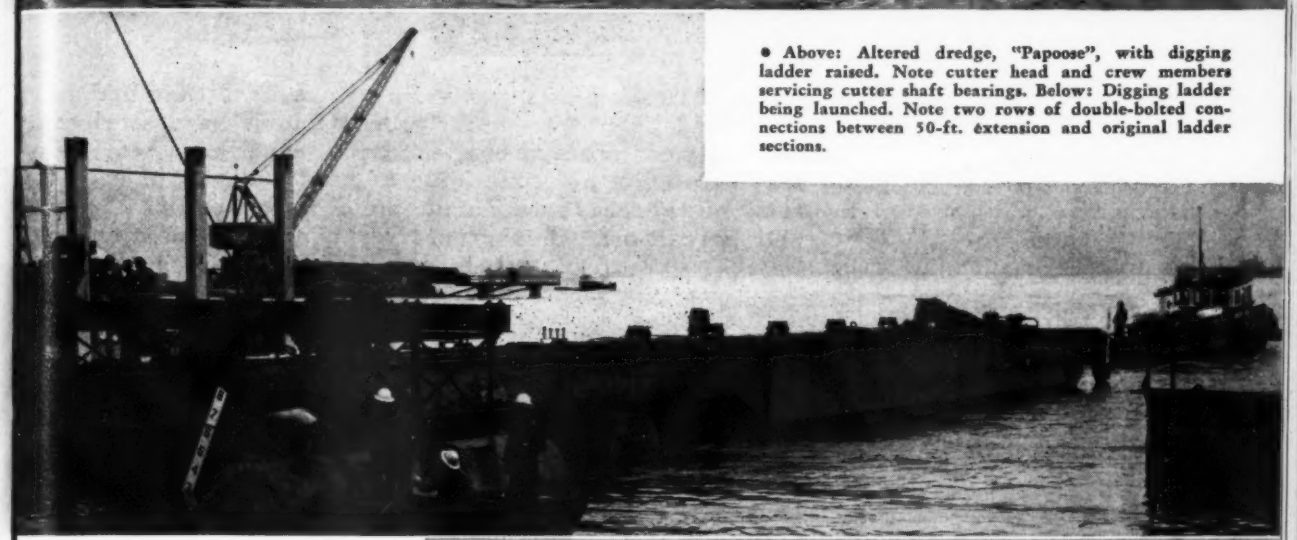
It is equally fallacious to expect an insurance carrier to assume these duties and responsibilities for its client, the contractor. In the first instance, the insurance safety engineer has not and cannot be expected to have the same degree of responsibility and concern as an official of the contractors' organization; secondly, he is not in command and at the very best, the insurance company safety engineer is a "foreigner" to the contractors' employees, as he functions, and properly so, as an advisor, and finally it is obvious that the insurance company safety engineer cannot participate in the essential planning that is fundamental to effective safety engineering.

5. Every general contractor should maintain a full-time safety engineer as part of the skeleton organization and smaller contractors should require one of its engineering personnel to be completely trained in the fundamentals of safety engineering.

Due to fluctuations in work, it has been the practice to "pick up" someone to handle the safety work when the contractor felt he was obliged to do so and let him go when the job was completed. It is only with a reasonable assurance of permanency that a capable safety engineer can be expected to develop an accident prevention program which will be effective in all its ramifications. A safety engineer of this sort should be able to pay his own way and a minimum of economic return from his efforts should be 1% of the dollar value per contract.

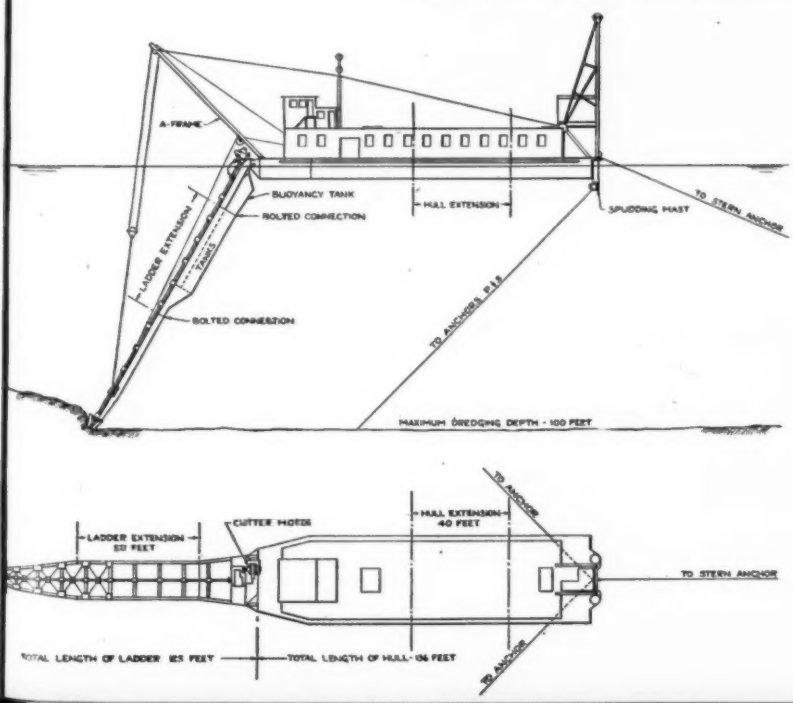
(Continued on page 285)





• Above: Altered dredge, "Papoose", with digging ladder raised. Note cutter head and crew members servicing cutter shaft bearings. Below: Digging ladder being launched. Note two rows of double-bolted connections between 50-ft. extension and original ladder sections.

Extending a Dredge



• Diagram of extensions made to the digging ladder and hull to enable the dredge to operate at a maximum depth of 100 feet; also the three-way anchoring used in place of the usual twin spudding arrangement.

Bethlehem Steel Company takes but 51 days to alter the 'Papoose' to enable it to do hydraulic dredging at unusual depth of 100 feet. Alterations are such that dredge can be readily converted to its former condition.

THE DREDGE "PAPOOSE," owned by the Hydraulic Dredging Company of Oakland, was recently altered at the San Francisco shipyard of Bethlehem Steel Company so that it could do hydraulic dredging at the unusual depth of 100 feet. The work was done in such a way that after this deep-dredging job was done, the dredge could readily be re-converted to its former condition.

The digging ladder was increased

(Continued on page 286)

• Symbolizing the work that must go on to make certain these dead shall not have died in vain, Asan Point cut stands out in the background behind this American cemetery. *U. S. Navy Photo*

Battle at Asan Point

Seabee battalion uses excavating equipment that had just completed 18 to 24 months of continuous hard service to hurriedly construct an eight-mile four-lane permanent highway through a hill containing 200,000 cu. yds. of excavation, mostly rock, on a Pacific island. Pure American "guts" and hard work, plus proper servicing and maintenance, bring success.

OUTSIDE, COLD LITTLE gusts of wind which introduce tropical rains blew fitfully through the jeep. And suddenly rain was pouring down at Asan Point, leaving a stream of red muddy water swirling away through the jeep tracks.

Towering 120 feet above mangli bushes in Asan Canyon stood a hill of gray, weathered stone. Dense hedge, mangli and tropical growth matted the sides. Dead Japanese, littering caves which pockmarked the base of Asan Point, turned stomachs of strong men. On both sides of this towering natural barrier were the center line stakes of a new highway. Somehow, bulldozers and road building equipment would have to scale a hill the surveyors had not yet attempted.

The hell of it was that this battalion thought they were going home. Out 23 months, slogging through tropical jungles, working at fever pitch, it seemed right that these boys should draw a lucky stub. Battalion equipment, with from 18 to 24 months continuous service, needed overhauling. But some battalions are lucky; some not so lucky. All take their part in the great scheme of war. That is why, this early autumn day of 1944, a bunch of weary, homesick construction boys found themselves looking at Asan Point. They had a road job to do.

A narrow road, curling through Asan Canyon, carried the ox cart traffic of other days. But now that Americans are here to stay, a new, four-lane highway will carry materials and supplies that must flow from the main port to all points on the island. At Asan Point the mountains come down to the sea, and the only way to carry the road at low level was to line it through a hill containing 200,000 cubic yards, most of which was rock excavation.

Construction Speed Essential

Speed of construction was urgent. Eight miles of new highway had to be built in a hurry, and this was no temporary job. This was roadwork as it is done in the USA. Asan Point, located about midway on the job, held the key which would let the project be finished progressively. Unless Asan Point was successfully whipped before the highway leading through flatter topography to the west caught up, a genuine delay might result to the work.

The hill is shaped like a hound's tooth, rising sharply from the floor of the canyon 120 feet below. And it nearly resembles a tooth in construction. It has a tough outer shell, corresponding to the tooth enamel, which is about 15 feet thick. This tough outer layer is hard limestone, solidified by action of air on coral formation after ages of exposure. The deeper down and the farther inside the hill, the softer the material became. But at the top, one long Texas boy drawled, "she was a bitch on wheels!"

The Seabees set up a heavy equipment shop and got all equipment running with the help of spare parts begged and borrowed from other battalions, from the Army Engineers, and from the Marine Engineers. It took a day for surveyors to cut their way to the top of the hill with machetes. It took a bulldozer three days to work its way around the hill and up. Often it was necessary to hook a second machine on and pull the first back on to the road. A Caterpillar D-8 and an International TD-18 with a Bucyrus-Erie Bullgrader were used on this early work without damage to equipment or casualties to personnel.

When the top was reached, the ma-

• This Bucyrus-Erie scraper excavates muck while a Northwest shovel loads hauling units in the background. *U. S. Navy Photo*

chine hardly found enough room to maneuver when it flattened the area. It had to go back down on the access road to get away from the first shooting.

Then came the rains; steadily, without letup for hours at a time. Eighty-one inches of rainfall drops on this island each normal year, and 75% of that falls between June and December. It fell without mercy, slowing down traffic which was passing Asan Point at the rate of 100 vehicles an hour.

Blast Drilling Top of Hill

All day and far into the night these worn, home-thinking Seabees whose morale should have been so low that it would have violated a censorship rule to write about it, lugged Ingersoll-Rand Jackhamers and wagon drills up to the top of the hill and set up a battery of three Caterpillar driven LeRoi 315 cfm compressors in the canyon. With a lone Seabee standing guard with a carbine to ward off any Japs still roaming around, these boys stood up there in the middle of the night with rain soaking them and the Jackhamers drumming the emptiness of their guts getting 18 feet of penetration on their wagon drill steel. At first they tried to work from 6 a.m. to midnight, and then they pushed the schedule up past 2 a.m. All the while, in their spare time, these men were working on their camp, trying to make it habitable.

They didn't let up on the drilling, as you'd expect them to. The holes went down roughly on five foot centers, and even less, because the ground wasn't too even up there on top of Asan Point, even after the bulldozers had done the best they could. Ingersoll-Rand jackbits, freshly sharpened, speeded up the drilling and in a few days they set off three tons of 40% Atlas and Giant gelatin. It was not the first time the sound of explosives had been heard at Asan. Our navy's guns had knocked out some Japanese gun positions there, and U. S. Marine Corps demolition charges had sealed the Japs in their caves at the base of the hill; aided by one of the International TD-18 mounted Bucyrus-Erie Bullgraders used by the Marine Engineers.

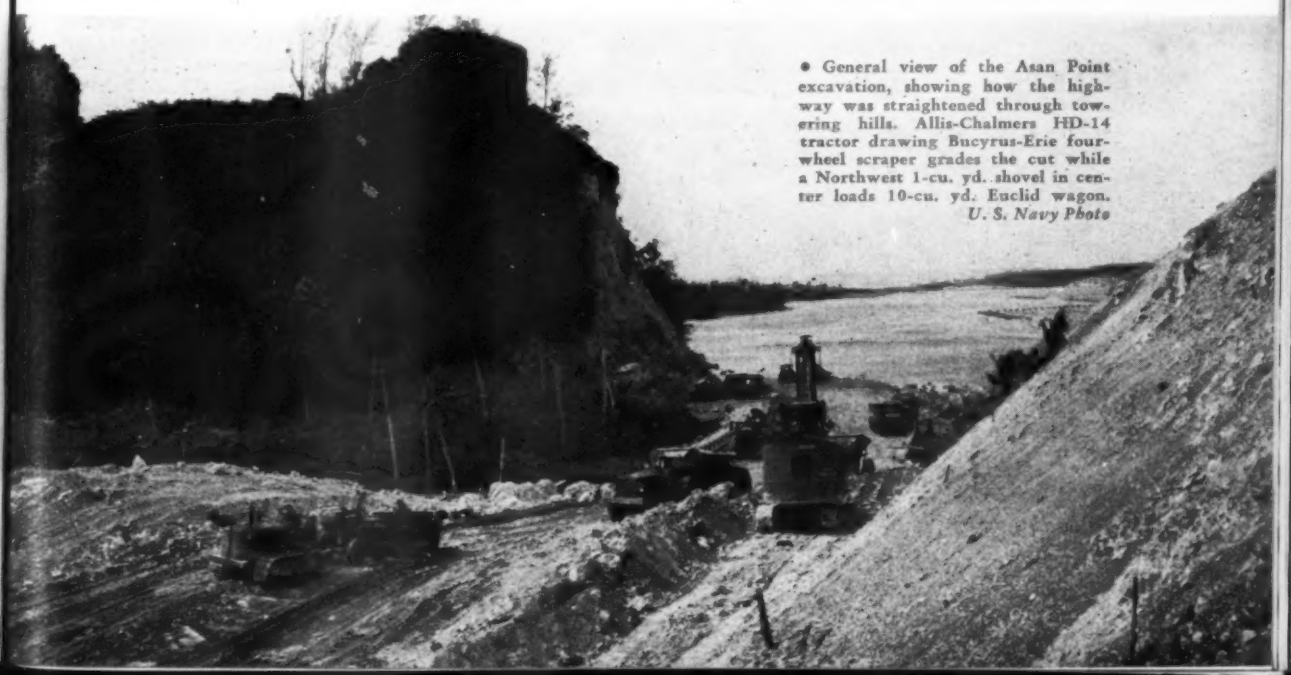
• Caterpillar tractor with LaPlant-Choate bulldozer pushes earth out of the cut. *U. S. Navy Photo*

Moving Blasted Material

The first three-ton shot loosened up 6000 cubic yards and the Seabees moved a Caterpillar D-8 bulldozer and an International TD-18 with a Bucyrus-Erie cable controlled Bullgrader up to the top and began pushing material off the sides. The scheme at Asan Point was to work the top of the hill down about 55 feet to a point where an access road could be built, after which shovels and trucks could be brought in.

As the rock was pushed off the top, however, it was loaded immediately by Northwest 78 and Northwest 80 shovels into a fleet of 10-cu. yd. Euclid wagons, four Walters Model FCRD 12-ton tractor-trucks, and five Mack end-dump trucks of 7½-cu. yd. capacity. The completion of the removal of Asan Point was so important that the Seabees sped each cubic yard of dirt on its way as soon as it was loosened. With drilling and bulldozing going on side by side on top of the hill, shovels and trucks loading at the bottom, and a short haul of only 1500 feet to the road fill areas on either side of the job, the Seabees proved the capacity of modern bulldozers for work when they kept this fleet of trucks busy with the output of two Bullgraders on top.

Secondary blasting was limited to the boulders pushed off the cliff by Bullgraders which were too big to be picked up by the 2½ cu. yd. Northwest shovel dipper. But these larger boulders were few and far between. A LeRoi compressor at the foot of



• General view of the Asan Point excavation, showing how the highway was straightened through towering hills. Allis-Chalmers HD-14 tractor drawing Bucyrus-Erie four-wheel scraper grades the cut while a Northwest 1-cu. yd. shovel in center loads 10-cu. yd. Euclid wagon. *U. S. Navy Photo*

• Campsite in background is levelled and filled with some of the material out of Asan Point cut. An Austin-Western motor grader (Model 99) works on the road in the foreground. *U. S. Navy Photo*

the hill and one Seabee with an Ingersoll-Rand JB-5 Jackhamer took care of all secondary drilling in three or four hours a day.

When the boys worked Asan Point down halfway, they used part of the bulldozed material on the east side to make a road — 34% grade — which would take a shovel and some hauling units. Remember Asan Point is built like a tooth, and here 60 feet down the inside core was soft limestone and shale, with streaks of clay present. All around the hill, however, ran this hard shell of solid rock which always had to be shot in advance of excavating equipment.

The Northwest machine worked the material out in ten-foot lifts, loading to single-spotted hauling trucks because of limited working space. Except for the rock shell, the material this far down could be dug by the dipper teeth, and the 1:1 side slope was shaped the same way without hand labor. As the excavation went farther down, the haul became longer. Toward the end of the job the trucks were hauling two miles one way, and were making between two and three loads an hour apiece.

A Northwest Model 25 shovel was moved in near the Jap caves at the south side of the hill adjacent to the road, and this machine began to load five International dump trucks with material for a fill. Before long the shovel reached the Nips, and for a few days nobody had much of an appetite, even for Spam, which goes by the name of "Seabee Steak". A fought-over area has a way of permeating the very earth with the smell of death, and Asan Point was no exception.

Build Campsite

While the shovels and trucks were removing material as fast as they could, the Seabees decided to make a camp site 2000 feet away. Thirty-inch lateral ditches two feet deep were dug by a Northwest 25 dragline every 100 feet over a 100-acre site, and filled with fine rock to form French drains. After the ditches were made and filled, the trucks from Asan Point dumped their loads in a single lift three feet deep over this boggy area. The top was smoothed down by an International TD-18 with Bullgrader and the finished fill was dry, stable, and more than suitable for a camp site.

After three lifts had been dug down by the shovels on the hill a rooter was hooked on behind a Caterpillar D-8 and the inside ground loosened up. An Allis-Chalmers HD-14 tractor with a Gar Wood cable power take-off was hooked on to a Bucyrus-Erie S-52 scraper and brought in to test the possibility of removing material with tractor-scraper combinations. The Seabees found to their mild surprise that the scraper loaded full, sometimes heaping over the sides, especially where clay seams formed in the rock. Two Caterpillar D-8's with LeTourneau FP Carryalls were also used. The loading area was only 200 feet long, so the scrapers had to have fairly good loading ability to pick up a bowl full of shale and rock in this short distance. A D-8 pusher cat was used when it could be spared, but most of the time it was needed to break up the rock with a rooter, since the equipment situation was as it was.

Nobody knows, better than a professional "nut buster", what a headache depreciated equipment is, especially when parts are not available. A D-8 tractor that ran over a land mine early in the invasion was cannibalized and yielded plenty of good spare parts. A rear axle on a LeTourneau Carryall went out, and this machine was idle for a few weeks because parts had to be flown in, but by working overtime the Seabee mechanical force managed by its own wits to keep most of the equipment going. Many parts were made in machine shops, sometimes on captured Japanese lathes. They made a jig and pestle for turning out leathers for pumps and hydraulic bulldozer hoists; not as good, perhaps, as the factory product, but serviceable.

Fuel and grease were brought out by truck and taken on the machines

(Continued on page 286)

• Left: Caterpillar D-8 tractor with LaPlant-Choate blade dozes dirt while an Allis-Chalmers HD-14 drawn Bucyrus-Erie four-wheel scraper excavates muck out of the cut. Below: Northwest 2½-cu. yd. shovel loads out a bottom dump Euclid wagon. *U. S. Navy Photos*

TILL THE JAPS SAY "UNCLE"

AMERICA bounced back hard in this war against the Japs, and the boys who led the rebound were *United States Marines.*

Ever since Guadalcanal the Marines have proved that boys from Kokomo, the Ozarks and the Bronx—when steeped in Marine Tradition, skilled with Marine training—are doggone good fighters. On beachhead after beachhead—then in jungle after jungle—they were far outnumbered by the Japs. But not outfought!

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They have good equipment, sure. Most of the thousands of trucks they use, for example, are Internationals. And most of the thousands of bulldozing tractors they use are Internationals, too. Trucks and tractors—vital weapons in this grim, modern war!

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Cape Gloucester. Then Majuro, first pre-war Jap territory to fall to U. S. fighters. Roi, Namur, and other islands in the Kwajalein atoll.

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Shots from the FIRING LINE

National Airport Bill Has Road Builders' Support

A national integrated program of airports for the immediate postwar years will provide a greater stimulus to the aviation industry than highways did for automobiles, Charles M. Upham, engineer-director of the American Road Builders' Association, told the Commerce committee of the Senate in a hearing on the billion dollar postwar aviation bill. Upham cited the great advancement made between 1919 and 1929 in those states which had pioneered in building extensive and permanent highways. He held that planes were actually more dependent upon airports than cars on hard roads.

The funds to be authorized under the bill are to be matched dollar-for-dollar by the states and their political subdivisions, and the American Road Builders' director called attention to the need for immediate action by the participants so that no delays would result when the war ended. He recommended that $20,000,000 be made available in the early stages to the states for the acquisition of land and for the preparation of airport plans.

Supporting his plea for action, Upham pointed out the many months required by the WPA in getting working plans ready, a condition which led to "leaf-raking" and other wasteful and extravagant forms of boondoggling. The expert strongly recommended the private contract system for all construction.

In a series of tests made by the Public Roads Administration projects were completed under the contract system at a saving of 18 to 31 per cent to the taxpayers over that by forced account methods. Work done under contract was much superior and lasting, he insisted.

Mr. Upham invited comparison to the similarity between airport and highway construction in operations, materials and equipment. "Airport builders have been able to learn much in recent years from highway engineers," he declared.

Airports and highways having so many features in common, he referred to studies by the Public Roads Administration which showed that for every $100,000,000 of highway construction there was $315,000,000 worth of business created or generated thereby in directly related industry. Upham's testimony also included emphasis upon the importance of the construction industry in our national economy.

"An annual construction program of 15 billion dollars will maintain full employment, and of this total, one-third or five billion in public works will supply the proper economic balance," Upham said in commenting on the part the airport program will play in providing employment to returning soldiers and to workers released from war plants.

Hon. Josiah W. Bailey (D., N. Car.), Chairman of the Commerce committee of the Senate, presided.

Estimate Materials Needed for 1945 Construction

Estimates of quantities of materials required for public and private construction in the United States for 1945 were released by the War Production Board.

The estimates have been made on the assumption of a full scale war (that is, in both Europe and the Pacific), WPB said, and consideration has been given to the extent to which other materials have been used as substitutes in construction.

Materials for which data are given are asphalt, building blocks, building boards, brick, cast iron (including that in pipe and fittings, radiators, boilers and bathtubs), cement, copper, gypsum board, lead, lumber (including millwork, flooring and prefabricated units), roofing (exclusive of non-asphaltic roofing such as metal, slate, wood, asphalt coated insulation board), sewer pipe, carbon and alloy steel, steel plate, structural tile and zinc.

Estimated consumption for 1945 follows:

Asphalt	1,165,200	short tons
Building Blocks	220,000,000	blocks
Building Boards	911,000,000	square feet
Brick	1,628,000,000	bricks
Cast Iron	338,300	short tons
Cement	89,400,000	barrels
Copper	28,177	short tons
Gypsum Board	1,740,000,000	square feet
Lead	32,340	short tons
Lumber	3,689,000,000	board feet
Roofing Materials	59,128,000	squares
Sewer Pipe	725,000	long tons
Steel	2,128,000	short tons
Steel Plate	300,100	short tons
Structural Tile	702,000	long tons
Zinc	9,118	short tons

Columbia Basin Project Plans are Progressing

Plans for construction of the huge Columbia Basin Project in eastern Washington, largest of more than 200 irrigation and multiple-purpose developments in the Bureau of Reclamation's three billion dollar postwar program, moved a step nearer completion when Secretary of the Interior Harold L. Ickes announced he had approved the repayment and recordable contracts for the project.

The approval, recommended by Commissioner of Reclamation Harry W. Bashore, clears the way for immediate presentation of the contracts to the landowners who will vote on the agreements in a special election this spring. The State Columbia Basin Commission and directors of the three irrigation districts which embrace the 1,029,000-acre area, have already indicated tentative approval of the contracts.

Construction of irrigation facilities can be started as soon as war conditions permit after the landowners approve the contracts and Congress appropriates funds. The Bureau of Reclamation is prepared to begin work as soon as these conditions are met.

Under terms of the contract, the three irrigation districts will assume a maximum obligation of $87,465,000

• Eliminating a railroad tunnel by a cut on the Union Pacific's main line near Meacham, Oregon. The Bucyrus-Erie 2½-cu. yd. shovel loading the truck and the Caterpillar Diesel D7 tractor with LeTourneau bulldozer are working on the 18-ft. level, lowest one of four benches cut in hillside to keep blasting under control so wartime traffic can continue uninterruptedly. 83,000 cu. yds. of rock are being moved on this job being done by Morrison-Knudsen Co. of Boise, Idaho.

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• Bucyrus-Erie Bullgrader used by American troops landing in Luzon, P. I., to pull a small field gun through beach sand.
Press Association Photo

toward repayment of construction costs on the irrigation system. This figure represents approximately 25 per cent of the total costs allocated to irrigation, and amounts to an average of $85 per irrigable acre, payable over a 40-year period plus a ten-year development period. The remaining 75 per cent of all costs allocated to irrigation, plus costs allocated to power-generation facilities, totaling approximately $399,000,000 will be repaid by revenues from sale of electric energy at the multiple-purpose Grand Coulee Dam on the Columbia River.

Kentucky Group to Back Anti-Diversion Campaign

A campaign for ratification of a state constitutional amendment outlawing highway fund diversion, which will be voted upon at the general election in Kentucky in November, will be conducted by the Kentucky Good Roads Federation, which has been formed by representatives of 44 Kentucky organizations.

The amendment, which would require that all funds collected from highway users, such as gasoline taxes and license fees, be spent only for road purposes, was approved for submission by the 1944 State Legislature.

Len B. Shouse, Lexington, president of the Blue Grass Automobile Club, was elected president of the federation, and Lewis B. Allen, Bowling Green, head of the Kentucky Farm Bureau Federation, was named vice president.

Shouse asserted that the amendment must be ratified to insure "full Kentucky participation" in postwar federal highway aid, which will require that Kentucky match $27,000,000 for improvement of rural, urban and state highways in the immediate postwar period.

Hessian Successfully Used on Airfield Surfaces

Not until about one month before D-day had successful airfield surfaces been produced with hessian. A Canadian-British development of burlap-like material made out of Indian jute, hessian is placed in two layers and impregnated with asphalt on the bottom of each layer. The previous theory, that the use of flexible waterproof hessian mat did not require fine grading and compaction had produced unsatisfactory results in all tests. Ninth Air Force Engineers produced an entirely successful landing surface by using hessian as a "roofing" over a well-graded and compacted area. An improvement in the bond further reduced the danger of soft spots due to the introduction of water beneath the mat.

Laid from rolls 100 yards long and 36 inches in width, the hessian mat is run through a "stamplicker," consisting of a series of rollers and a rotating drum filled with asphalt (50% gas and 50% R C-3). As the "stamplicker" moves along, the mat is paid out, completely gummed on the bottomside. The second layer overlaps the first by 50%. Generally the strips are "shingled" in from the shoulders to a seal-strip at the crown, but occasionally it is necessary to "shingle" across the runway to protect a sloped surface.

Hessian, which covers a great number of the airfields in France, can be laid about as fast as square mesh, and faster than steel-pierced plank. A 5000-foot runway requires about 16 hours for an experienced unit as against 20 hours with pierced plank. In addition, its surface gives better traction and braking than that of any other landing mat and is mud- and dust-free. Hessian is also easier on tires, though turning areas have to be covered with square mesh to avoid the tearing effect of

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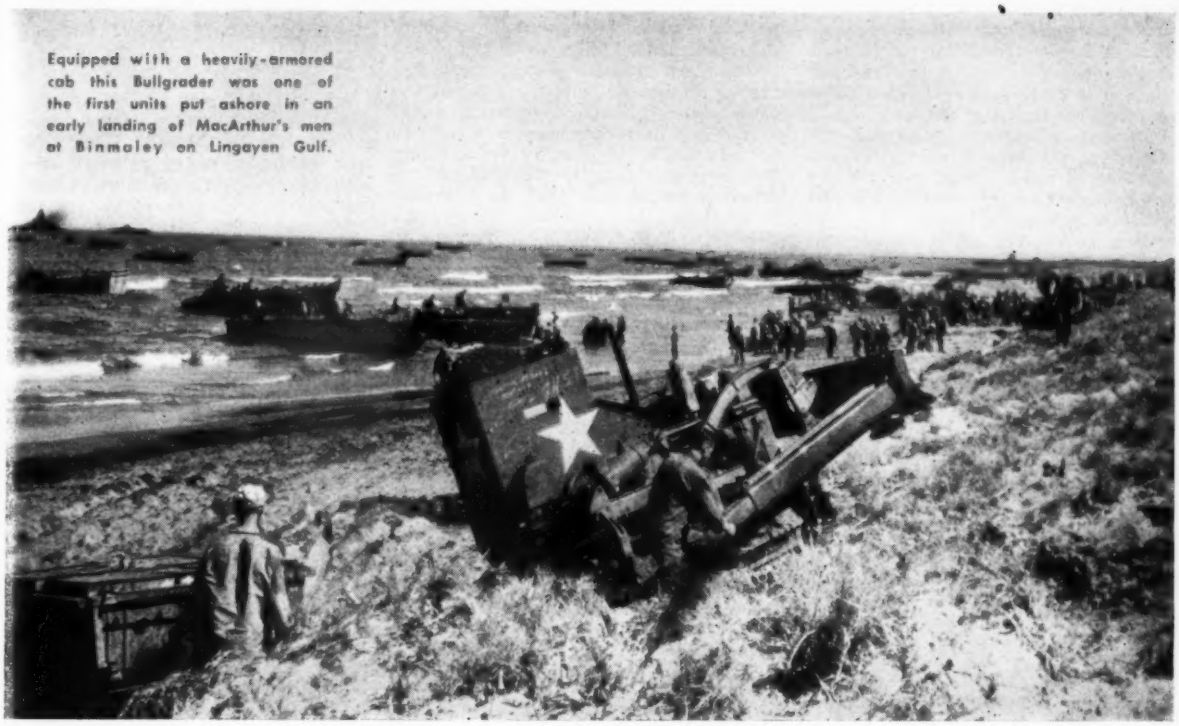


Equipped with a heavily-armored cab this Bullgrader was one of the first units put ashore in an early landing of MacArthur's men at Binmaley on Lingayen Gulf.

SHORTENING THE ROAD TO TOKYO

Guadalcanal . . . New Guinea . . . Saipan . . . Luzon . . . Iwo . . . each advance in the relentless drive on Japan brings new, "impossible" jobs to do — roads to cut through jungle, airports to build with coral, by-products of battle to clear, unforeseen emergencies to meet.

Versatile earthmovers, like the Bucyrus-Erie Bullgrader above, take the "impossible" in stride. Established in peacetime and confirmed in battle, their dirt-moving efficiency puts them in the van of every invasion. The call for them continues, undiminished, to help speed work on the biggest contract in the world — shortening the road to Tokyo!

2T45C

While a large share of our production is still going to the armed forces, a limited number of Bullgraders, Bulldozers, Scrapers and Dozer-shovels are available for civilian use. See your International TracTracTor Distributor for information on new Bucyrus-Erie Tractor Equipment and for rentals and service. Let him help you modernize your equipment at Victory.

BUCYRUS-ERIE CO., SO. MILWAUKEE, WIS.

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

planes which lock one wheel and spin on it. A further advantage of Hessian is that only 850 tons of material are required to cover a normal size field as against 4000 tons for pierced plank.

Original estimates concerning the life of a hessian-covered operational field was 60 days. But at the end of a 60-day period on the first hessian covered field, where 300 loaded C-47s were landing and taking off every day, the surface showed no appreciable wear. In General Newman's words, "We still do not know the life of hessian mat, for not one field has failed." Small repairs can be made by two men, a mop, a bucket of asphalt and a roll of material. Swab it, lay it, walk across it and the patch is made. Hessian mat was an important asset to the invasion forces.

But there are also disadvantages to the use of hessian, and these began to show up as the European campaign moved into its winter season. It cannot be laid either in rain or in a wind greater than 15 miles per hour. At a temperature of less than 45 degrees Fahrenheit, the material will crack, check and distort, making it impossible to secure a satisfactory bond. In winter operations, therefore, the all-weather pierced plank landing mat is used almost exclusively in new construction. And a few heavily-used key fields have been covered with pierced plank to insure all-weather operation.

Complete Six Month Bridge Job in 16 Days

When U. S. Army Engineers headed toward the Rhine, there was one strategic spot on the Moselle River where they needed a heavy railroad bridge with concrete and steel piers to handle heavy trains with superweight materiel.

After dumping everything available into the river to make a ford to the pier sites, they had to mix concrete in freezing weather. They built a roaring fire, then piled on sand and gravel. The fire dwindled but the hot embers made the sand and gravel warm enough to mix and pour concrete.

To keep the freshly poured concrete from freezing while it set, the Engineers punched holes in the sides of empty cans and filled them with hot coals. The hot coal "stoves" were stacked around the newly poured piers and tents were erected over each unit. Thus, the concrete was kept from freezing and it had set in 12 hours.

In 16 days, the heavy bridge was completed. Great beams had been installed. The steel work was in. Rails were laid and the heavy freight rolled across where French Engineers said "that it could not be done in less than six months."

But more Yanks with their supplies were on their way as they poured across toward the Rhine.

Ask Surpluses be Confined to Industry Channels

Follow the recommendations of the Baruch report by confining distribution of billions of dollars worth of war surpluses to industry channels as far as is practically possible and feasible, in order to eliminate speculators and, according to Hamilton O. Penn, President of Associated Equipment Distributors, "prevent a new crop of post-war millionaires from making fortunes on the products of industries with which they have never been identified in the past and to whose products they contributed nothing in the way of plans, labor, manufacture or sale."

This was the gist of a resolution adopted by the Executive Committee of the AED who deal in the distribution and manufacture of machinery and equipment in the construction, highway and roadbuilding industries.

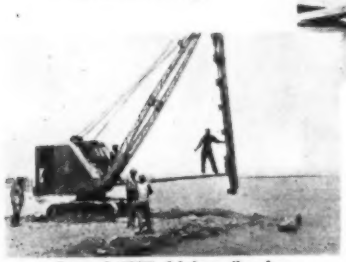
"It is highly doubtful," Penn told members from all sections of the country, "whether the Surplus Property Board will be able to cope with the many vexing problems that will arise in connection with the distribution of such vast quantities of war materiel for which the need, in the European Theater as least, is fast drawing to a close, without constant cooperation from those in this and other industries who are in the best position to know what is going on and to know what method of distribution would be most fair to the industry, the government and the tax payer.

"The distributors and manufacturers

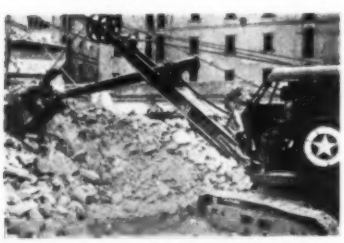
JACK OF ALL JOBS—

in heavy materials handling

Above—Vital supplies and equipment being unloaded by a "Fighting Osgood Mobilcrane" in the South Pacific.



Osgood "30" driving piles for a landing pier in North Africa.



Helping to clear the way to Berlin and Victory, "Fighting Osgoods" serve under fire with Army Engineers in Europe, as well as on other battle fronts.

"Fighting Osgoods" LIFT, DIG and DRIVE in the Battle of Supply

When the engineer troops and SeaBees "go in" on the heels of our attacking forces, they need the right equipment to do a multitude of jobs quickly and efficiently. Roads and air fields must be leveled, loading docks built, supplies loaded and unloaded, rubble cleared away fast.

Osgood shovels and cranes figure dependably in all these operations . . . working as crane, pile driver and shovel. They're engineered with the power, stamina and versatility to keep precision planning and production on schedule. You'll appreciate these advantages when *your* planning goes into action after Victory.

WHEN IT'S WAR BONDS, BUY MORE THAN BEFORE!

THE GENERAL EXCAVATOR COMPANY
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company

OSGOOD

THE OSGOOD COMPANY • MARION, OHIO

ARMY E NAVY

OSGOOD
SHOVELS, DRAGLINES
CRANES

Announcing Improvements on the MISSISSIPPI WAGON

One of the New MISSISSIPPI WAGONS

You Now Get More Speed (up to 25½ m.p.h.), Synchronized 4-Wheel Tractor-Trailer Brakes, Other Features

Improvements made to increase the general versatility and efficiency of the MISSISSIPPI WAGON, now more than ever make it "the World's Most Modern Hauling Unit."

Gear changes in the M-R-S Special International Diesel tractor now make it possible for MISSISSIPPI WAGONS to travel at speeds up to 25½ miles per hour, saving valuable time and increasing profits on long hauls.

Four-wheel trailer brakes are available and are synchronized with the hydraulic brakes on the tractor, providing unusually smooth, effective handling for fast stops and steep grades.

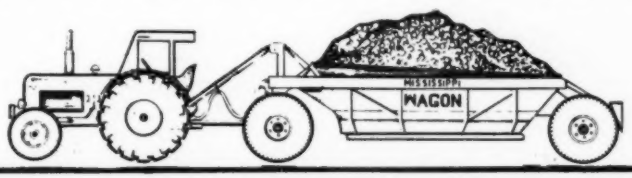
If your problem is hauling over the highways on long hauls, the MISSISSIPPI WAGON will now provide you with still greater economy than heretofore.

If your problem is construction work, the MISSISSIPPI WAGON will give you unusually low hauling costs per yard, placing you in the position of meeting and "beating" that tough postwar competition.

We can make deliveries for essential civilian uses, because our 1945 production is more than twice our 1944 production.

Write us or consult your nearest International Power Distributor for full information on MISSISSIPPI WAGONS — a thorough investigation will warrant your investment in MISSISSIPPI WAGONS.

"THE WORLD'S MOST MODERN HAULING UNIT."



M-R-S MANUFACTURING CO.
JACKSON, MISSISSIPPI

• First Army Engineers lay wire netting for a temporary roadway and bridge across a stream in Belgium. Area was previously levelled by LeTourneau bulldozers in background. *Signal Corps Photo*

of the hundreds of millions of dollars invested by tax payers in bulldozers, cranes, power shovels and other heavy machinery and equipment that has played such a dramatic role in strengthening the arm of our forces on land, on sea and in the air, also have a very important stake in the post-war economic picture. The nation's highway construction program itself was far behind up to Pearl Harbor. The nation's highways, roads and railroads have taken it on the chin since the war by the daily haulage of excess loads of war equipment causing undue wear and tear on roads, highways, railway road beds, rolling stock, etc.

"Millions of Americans will want to travel by automobile, bus and railroad as never before in the post-war era. This means a national program of construction to take care of post-war needs will be inaugurated. Jobs will be provided for hundreds of thousands, if not millions, which will be a significant step in meeting our post-war employment problem.

"This is the main reason why machinery and equipment no longer needed for war purposes should be as quickly as possible routed through constructive channels so that the greed of speculators and all others who have contributed nothing to our own and other industries may not stand in the way of and needlessly increase the cost of distribution of machinery and equipment and other products necessary for post-war development and prosperity."

State Road Debts Total $1,618,049,000

State highway obligations outstanding December 31, 1943, totaled $1,618,049,000, according to figures recently released by the Public Roads Administration. The purposes for which these obligations were incurred include:

State highways	$ 975,213,000
Special state issues for bridges and grade crossings	152,090,000
Special construction issues, state highway share	42,970,000
State issues for toll roads and bridges	156,247,000
State issues for reimbursement	98,425,000
Reimbursement obligations assumed	182,512,000
State issues for county or local roads and bridges	10,592,000
	$1,618,049,000

Against the above obligations there was held in sinking fund reserves on December 31, 1943, the sum of $208,903,437.

Bonds of interstate toll authorities and others primarily of urban or local character are not included. Among those not included are: Port of New York Authority (New York and New Jersey), $181,046,000; Delaware River Joint Commission (Pennsylvania and New Jersey), $37,000,000; Lake Champlain Bridge Commission (New York and Vermont), $1,219,000; Golden Gate Bridge District (California), $34,600,000.

PRA reports that during the calendar year, 1943, additional bonds amounting to $30,721,750 were assumed by states as follows:

Alabama	$ 4,178,000

(Upper View) Sauerman Slackline Cableway moving gravel from wet pit to screening plant. (Lower View) Sauerman Scraper reclaiming crushed rock from stockpile.

SLASH COSTS
in moving materials

Ask any operator of a Sauerman Scraper or Cableway and he will tell you this is generally the cheapest way to handle materials on long hauls.

These machines dig, haul and dump automatically in one operation and are adaptable to a great variety of ground conditions.

Operator has finger-tip control of the entire operation—power demand is moderate—repairs are few and simple.

Sauerman engineers will gladly study your digging or stockpiling problems. Their advice may save you money and will be given free. Write for our catalog and tell us about your problems.

SAUERMAN BROS., INC.
574 S. Clinton St., Chicago 7, Illinois

SAUERMAN
Long Range Machines

Florida	2,446,250
Iowa	2,750,000
Louisiana	1,100,000
New Hampshire	300,000
New York	12,000,000
South Carolina	150,000
Tennessee	4,797,500
West Virginia	3,000,000

Disbursements on account of debt service in 1943 aggregated $180,907,265 of which $122,007,813 represented retirement of principal, the balance covering interest, administration and premiums paid on called bonds.

Current receipts during 1943 applicable to debt service amounted to $175,943,758, of which $142,902,354 was provided by highway user taxes, $12,080,250 by highway user tolls, $4,777,202 paid from sinking funds, largely contributed in earlier years by highway users, and $12,146,236 derived from proceeds of refunding issues. Other miscellaneous receipts, including general property taxes, provided $4,037,716.

Organize Committee for Reconversion Problems

Organization of a committee that will be responsible for working out the details of delicate problems involved in modifying and relaxing war and war-supporting production controls on industry, was announced by J. A. Krug, chairman of the War Production Board.

The committee, to be known as the "Committee on Period One" (CPO), will also be responsible for timing of the measures that will be taken and for the formulation of an over-all pattern to be followed as a guide in aiding the resumption of civilian production following "Victory-in-Europe" Day. "Period One" is the name given to the time expected to elapse between victory in Europe and victory over Japan.

The committee is divided into 11 principal sub-committees, each charged with certain phases of the over-all problem. The Construction and Construction Controls is headed by John L. Haynes, chairman. This committee will determine the status and prospects of essential civilian construction, the problems of reconversion in the construction industry and desirable changes in construction controls.

Re-elect J. S. Williamson Highway Commissioner

J. Stanley Williamson of Anderson has been re-elected chief highway commissioner in South Carolina for a four-year term, starting April 1.

With the South Carolina highway department in various capacities for the last 23 years, Williamson was first elected chief commissioner to fill the unexpired term of the late Ben M. Sawyer, who died in December, 1940.

W. H. Daniel of Mullins was elevated from vice-chairman to chairman of the commission, succeeding R. M. Dacus of Greenville; and G. M. Neeley of Denmark was named vice-chairman. Both Daniel and Neeley have served on the commission three years.

Williamson was president of the American Association of State Highway Officials in 1941 and the same year was named by President Roosevelt to the fourth Pan-American Road Congress in Mexico City.

Minnesota Iron Reserves

The mines of Minnesota have produced and shipped 1,500 million tons of iron ore since 1884. It is estimated that almost the same amount remains in the ground. According to state engineers Minnesota has reserves of 548,000,000 tons of high grade open pit ore, 414,000,000 tons of underground ore, 174,000,000 tons of low grade ore and untold reserves of iron bearing taconite.

Midwest Mines to Provide More Coal for Railroads

Midwestern bituminous coal mines are being called upon by the Solid Fuels Administration for War to provide more than 2,000,000 additional tons of coal for railroad locomotive fuel as part of the 1945-46 program to get maximum use from anticipated limited supplies, SFA reported.

This tonnage, Deputy Solid Fuels Administrator Charles J. Potter said, will replace a similar amount of Ap-

GATKE
BRAKE BLOCKS

Custom-Bilt
for Trucks, Tractors, Trailers, Buses and Heavy Duty Axles

War-created scarcities *make Tires and Time priceless* because Trucks, Tractors, Trailers, and all sorts of heavy equipment must be kept going.

In such conditions the Extra Qualities of GATKE Brake Blocks stand out like a lighthouse in a storm. They give smooth, non-grabbing action that saves tires and equipment—Tremendous Stopping Power for Safety and Dependability — Long wear life for extra mileage between adjustments.

Try GATKE Brake Blocks for your next 5 relines. Compare results with the best you ever had. Ask your GATKE Jobber or write for particulars.

Gatke CUSTOM-BILT BRAKE LININGS
BLOCKS SETS ROLLS SHEETS
GATKE CORPORATION
228 N. La Salle St., Chicago 1, Ill.

use time-saving
TOURNAWELD
ROD

Tailored to construction equipment needs, Tournaweld is a specialized premium-type rod that saves you money because it is easier and faster to apply, fits field repair conditions, stands up under tough dirtmoving usage.

77 (light yellow) all position general purpose, AC or DC

88 (black) for downhand, horizontal or flat fillets, etc., AC or DC

LT (brick red) for full crowned welds on corners and troughs, downward, AC or DC

78 (light red) special for high tensile strength, AC or DC

HF (black) for hard surfacing, toughens under abrasion, DC

RW (black) special for track rollers, rails and similar hard-wear service, DC

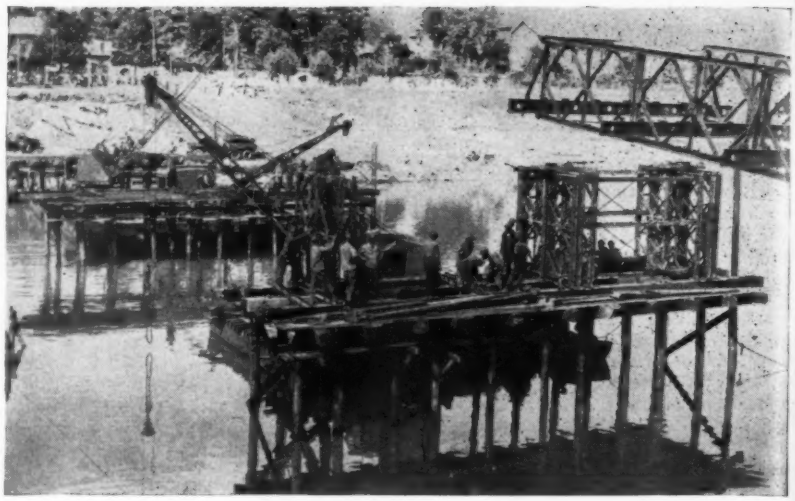
Try TOURNAWELD for faster application, longer life

See Your TW2
LeTourneau Distributor
R. G. LeTOURNEAU, INC.
Peoria 5, Ill. Stockton, Calif.

palachian mined soft coal formerly used by midwestern railroads, thus shortening transportation hauls and freeing fuel for consumers who are entirely dependent on eastern coals.

The 15 railroads and railroad systems that will use the extra midwestern soft coal will reduce their consumption of eastern bituminous coal moved via Great Lakes vessels by about 975,000 tons. The railroads also will reduce consumption of Appalachian coals shipped to them by all-rail routes approximately 1,185,750 tons from 1944-45 fuel year rail-hauled tonnage.

Under the new program the affected railroads will take 4,354,000 tons of eastern-mined soft coal via lake vessels during the 1945-46 fuel year as against the 5,329,000 tons shipped by water that they consumed in the 1944-45 fuel year. The railroads will haul by rail from the East some 15,423,906 tons for their own use in the 1945-46 fuel year, as compared with 16,609,656 tons moved all-rail in the 1944-45 fuel year.



• Three crawler cranes are used by Army Engineers in putting a Double Bailey Bridge across the Arno River in Italy. Sections of steel beams are spiked to the timbers on the first pier to hold the upright supports for the bridge. The crane in the foreground and the one nearest to shore are Bucyrus-Eries and the center one is a Lima. *U. S. Signal Corps Photo*

Contractor Asks Readers' Help to Solve Problem

A reader in Canada requests suggestions for the solution of a problem with which he is faced. The problem is:

"To construct a well-compacted fill varying from 500 to 10,000 cu. yds. from sticky clay, to which brush may be added as a binder. The ground will support a dragline on mats but a bulldozer is helpless. The road to the site of the work is over the same sticky clay and the nearest ordinary loamy or gravelly soil is from one to two miles distant."

In the past the work has been done by hand and team labor, of which there was an abundance. Now hand labor is not available.

The question the Canadian reader asks is:

"Is there any known record of some ingenious contractor who has solved a similar problem, using a combination of machines to replace hand labor, and kept the cost down?"

All suggestions received by Excavating Engineer will be forwarded to this Canadian reader.

Oppose Proposals That Might Hamper Construction

Vigorous opposition to proposals that might hamper the construction industry in the postwar period and renewed emphasis on the need for advance planning of postwar projects to the contract letting stage were voiced at the annual meeting of the Governing Board of the Associated General Contractors of America at the Stevens Hotel in Chicago in March.

The Board approved the accelerated depreciation of new commercial and industrial structures for taxing purposes in the postwar period, as a means of stimulating business activity, and asked for an increase of the proposed appro-

(Continued on page 270)

ROGERS TRAILERS

ARE AGAIN AVAILABLE

IMPROVED methods and expanding facilities have increased our production to a point that meets continuing military demands and enables us to supply a limited number of trailers for commercial use.

If you are one of the many contractors or riggers who have wanted Rogers Trailers, we will be happy to go into the matter with you.

If our catalog will be of interest, we'll be glad to send it to you.

ROGERS BROTHERS CORP. ALBION, PENNA.

EXPERIENCE *builds 'em* ROGERS LOW BED Heavy Duty TRAILERS *sells 'em* PERFORMANCE

. . . ABOUT FACE!

About faced, the forces that generated the world's miracle of production can rebuild the economy, make jobs, combat inflation and postwar slump. To do this, however, private industry must have freedom of enterprise stimulated by fair and honest competition. To have this, private industry must see to it that sound plans are first made, then carried out without becoming hamstrung.

For example, legislation for a highway program has been passed by Congress. It calls for a great highway system to be built by efficient contract competition. Most states are far from ready to meet its requirements which call for completed, approved plans before contracts can be let. Definite action is being taken by many responsible officials, but it is a big job and every cooperation should be given them so that time will not be lost because of unprepared plans. Important information on this subject is available in the book "The Road Ahead" published by the American Road Builders' Association, Washington, D. C. It should be read by every person interested in keeping America the land of opportunity. Check the coupon for a copy of this book and send today.

Another project vital to the national economy is developing. The Civil Aeronautics Administration report to Congress included a plan for national airport development. "Put Your Town on the Air Map" is the title of a book published by Personal Aircraft Council of the Aeronautical Chamber of Commerce of America, Inc., Washington, D. C. Send coupon below for this book.

UNION WIRE ROPE CORPORATION, 2142 Manchester Ave., Kansas City 3, Mo.

☐ Send a Free copy of book entitled "The Road Ahead"

☐ Send a Free copy of book entitled "Put Your Town on the Air Map"

NAME_____ B-45

FIRM _____

ADDRESS_____ CITY_____ ZONE_____ STATE_____

Shots from the Firing Line

(Continued from page 266)

priation for planning of postwar public works projects. These funds would be made available to local governmental and political subdivisions on a loan basis for use in completion of plans for local projects.

Renewed vigor was also recommended by the Board in efforts to stimulate the advance planning "of necessary and worthwhile construction projects which will contribute to building a greater nation, and will provide work and business opportunities for war workers and veterans." It recommended that AGC members aim at stimulating the planning of projects sufficient for an annual rate of construction of $12,000,000,000 by the end of the first year after the war — which would provide work and business opportunities for approximately 2,400,000 men and women at the site of construction and nearly 5,000,000 others off the site—in supplying materials and performing necessary services.

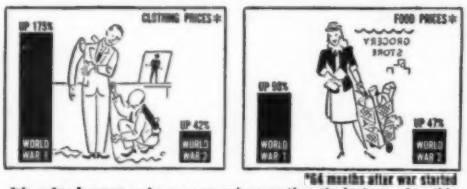
Establishment of a Missouri Valley Authority or other river valley authorities was deemed unnecessary and undesirable. By the Board which approved instead the policy of development by the Bureau of Reclamation and the U. S. Corps of Engineers. It was pointed out that these agencies have made surveys and developed plans for the contemplated improvements in the upper Missouri Valley and other rivers, and are prepared to put their plans into effect with very little delay after the war.

William Muirhead, Durham, N. C., retiring president, stressed five factors as essential to construction activity after the war. The factors were: (1) the advance planning of construction projects to the contract letting stage; (2) the orderly relaxation of Government restrictions; (3) the incentive to invest in construction; (4) a continued raising of the standards of living in the Nation; and (5) the confidence of the people in the construction industry.

He also cited two problems of vital importance to the industry. One was the theory that the Government should guarantee to each person willing and able to work the opportunity for a job. The other was "the recent rash of proposals for stabilizing the construction volume." He declared neither could be brushed aside lightly, and he recommended they should be given serious consideration "so that actions are not taken which will destroy any of the industry's efficiency so that the nation does not lose more than it stands to gain in such proposals."

The Market Development Committee, headed by Fred I. Rowe, of Columbus, Ohio, reported that the size of the postwar construction market should be ap-

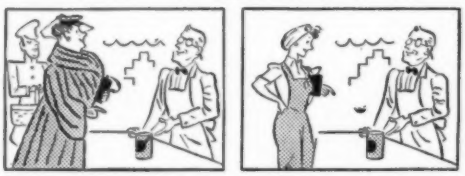
"Ceilings" are saving you money



*64 months after war started

It's a far longer and more expensive war than the last one—but this time the cost of living hasn't been allowed to get out of hand. If you're tempted to grumble at price-and-wage controls, look at these charts—and DON'T. They're one reason to bless ceiling prices. Check 'em whenever you shop. (They're posted for your protection!)

Rationing gives all a fair share



The Millionbucks get no more points than the poorest folks in town. Necessities are rationed to see that each gets his share. Rationing keeps prices down: otherwise the man with the biggest wad of dough would have a terrific edge. Share and play square; pay points for everything you buy. (Shun black markets like the enemy they are!)

—and the money you DON'T SPEND helps hold living costs down

The plain bread and butter fact is this: there's about $1.50 in people's pockets for every dollar's worth of goods in the stores.

Splurge—buy anything you don't actually need—and you put the heat on everything to rise all along the line.

Save—deny yourself something you want but can get along without—and you help yourself a little today and a lot tomorrow.

Squeeze that budget. Squeeze a little more money into your savings account. Squeeze a little more into insurance. Squeeze yourself into buying another War Bond today . . . and every month from now on in.

Wise enough to harness your money for your own safety?

ONLY YOU CAN DO IT.

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

A Time-Saving ACCESSORY

Bulldog ROPE SOCKETS never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in dozen sizes and four different styles.

T34C

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

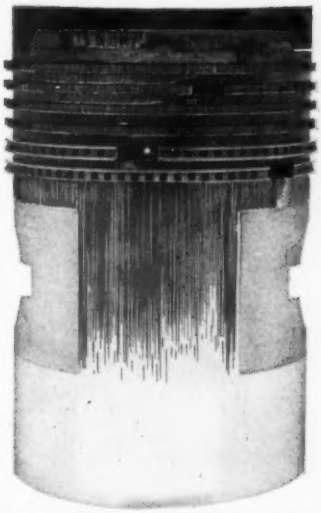
How RPM DELO Oil reduces engine wear

NEW PISTON RING

SCRATCHING WITH UNCOMPOUNDED MINERAL OIL

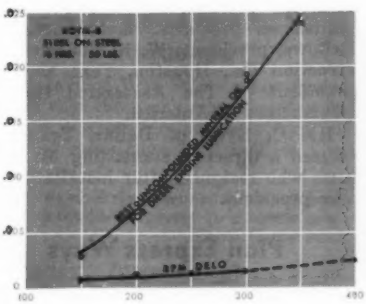
RING USED WITH RPM DELO OIL

The actual photographs above, in which the lines are merely emphasized by printing in red, are typical of the results obtained when testing RPM DELO Diesel Engine Lubricating Oil against ordinary Diesel oils. Because RPM DELO Oil contains a patented metal-adhering compound, it clings to hot cylinder spots that other oils leave dry, protecting rings and liners against excessive wear.

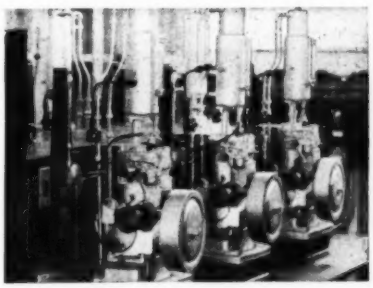


Here is a piston used in a special break-in test with straight mineral oil. This actual photo, with scratches emphasized in red, shows how rings, lands and skirt are badly scratched.

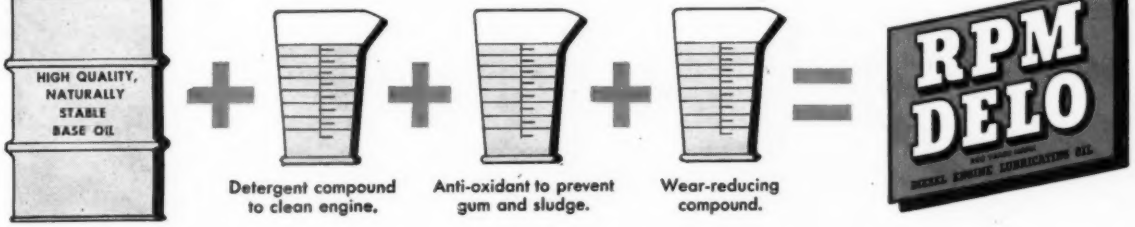
This piston went through the same test as the one above—but with RPM DELO Oil. No scratching occurred and every ring is free. RPM DELO Oil's film prevents scratching and scoring.



Confirming actual tests in engines are such laboratory tests as this with a Kinetic Oiliness Testing machine. RPM DELO Oil has far lower wear rate than the best uncompounded oil.



Here is a battery of special test engines in California Research Corporation's laboratories. They are used to determine the anti-ring-sticking properties of oils.


HIGH QUALITY, NATURALLY STABLE BASE OIL
Detergent compound to clean engine.
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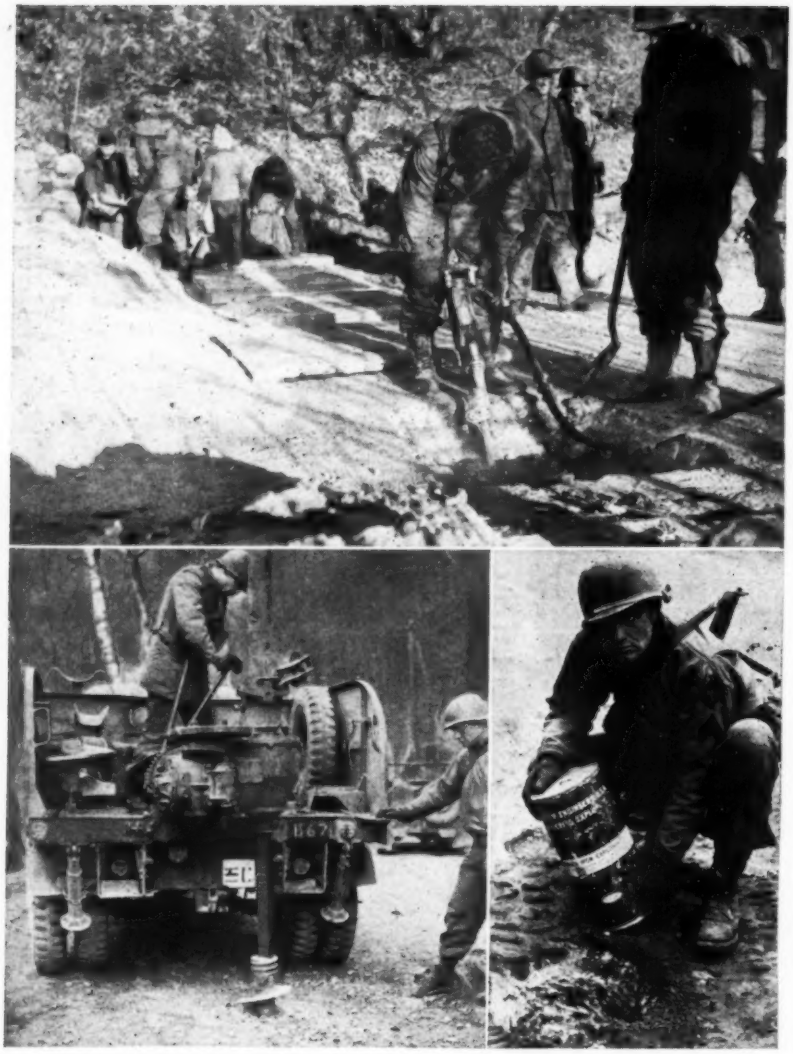
RPM DELO Oil has world-wide distribution, marketed under following names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Sohio RPM DELO, Imperial RPM DELO (CONCENTRATE)

For more technical information about this revolutionary Diesel Engine lubricating oil, write to Standard of California, 225 Bush St., San Francisco 20, California, or California Commercial Co., 30 Rockefeller Plaza, New York 20, N. Y.



• Preparing rock blocks. Top: Army Engineers use pneumatic jackhammer to dig holes in road pavement for placement of demolition charges in France. Lower left: Engineers use a telephone pole hole digger to make holes in road for explosive charge, to be detonated if troops are required to withdraw to more strategic positions. Lower right: Sgt. David Blackmer of Mulliken, Mich., places a can of explosive in the hole in the road.

U. S. Signal Corps Photo

proximately $15,000,000,000 annually. This would be 10 per cent of the $150,000,000,000 post-war national income, the figure frequently mentioned as necessary to assure something approaching full employment. Of the construction volume, approximately $10,000,000,000 be in privately financed construction and the remainder would be public works.

Surveys on the status of plans for postwar construction indicate, the report said, that plans are now under way or completed which will provide approximately $2,500,000,000 in public works construction during the first postwar year. Of that volume, approximately $1,000,000,000 is in federal-aid highways, another billion in state and local projects, and the remainder federal projects.

Tabulations of privately financed construction show a very small amount. However, it was reported that there are indications that a large volume of privately financed construction is being planned, particularly in the industrial field.

H. E. Foreman, managing director, also called attention to proposals for development of natural resources after the model of TVA, for stabilization of the construction industry, and for the government to guarantee to each citizen the right to hold a job.

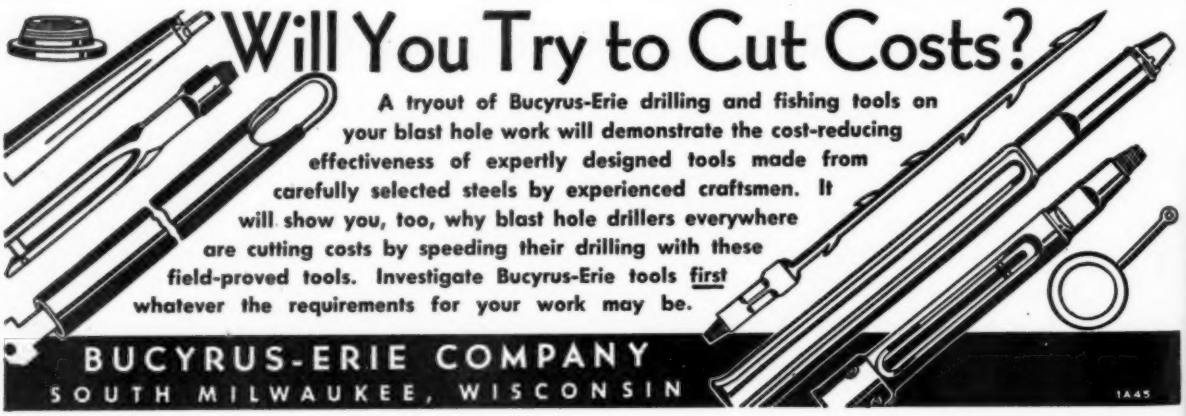
"In one degree or another," he explained, "these proposals are aimed at making the federal government the dominant factor in our national life, and at bringing about a fundamental change in our form of economy.

Harry A. Dick, president, Gilpin Construction Co., Portland, Ore., was installed as president, and Warren S. Bellows, president, W. S. Bellows Construction Co., Houston, Tex., as vice-president of The Associated General Contractors of America.

Hal C. Dyer, of Dallas, Tex., was elected a director, succeeding Mr. Bellows who resigned after installation as vice-president.

Plan Express Ways

As Baltimore continues to debate advisability of constructing a $40,000,000 mid-city express-way, 11 other large cities have approved or are contemplating building of at least 22 express-ways


Will You Try to Cut Costs?
A tryout of Bucyrus-Erie drilling and fishing tools on your blast hole work will demonstrate the cost-reducing effectiveness of expertly designed tools made from carefully selected steels by experienced craftsmen. It will show you, too, why blast hole drillers everywhere are cutting costs by speeding their drilling with these field-proved tools. Investigate Bucyrus-Erie tools first whatever the requirements for your work may be.
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or similar through arterial traffic routes, a report of Public Roads Administration revealed. The report shows that Detroit has a program calling for annual expenditure of $12,000,000 for 12 years by city, county, state, and federal governments. New York plans at least five express-ways; Detroit and San Francisco, three each; and Los Angeles and St. Louis, two each. Five other cities contemplate construction of a single express-way each and Cleveland plans to extend two existing express-ways.

Completes Poem

Howard Bridges, co - partner of Bridges Asphalt Paving Co. of St. Louis, Mo., felt the poem on the engineer — "The Forgotten Man" — printed on page 162 of the March issue lacked completion and so submitted the following concluding verse:

"But for all this strife and care
There must be a counter-balance,
I'm sure that the world is aware
Of the man with all his talents.
When I think of the ones I've worked with
Seen their labors crowned with success,
There must be no finer feeling
Or greater pride to possess.
So I've come to this conclusion
And I state it in spite of a sneer,
They wouldn't trade wealth or position
For their title of Engineer.

Alaskan Road Not to Be Abandoned

Secretary of War Stimson has denied rumors that the Army may abandon the Alaskan Highway which was built at a cost of more than $139 million.

• Koehring crane is stowed on boat for shipment to a battle area.
Signal Corps Photo

Road Legislation Summary Given for 14 States

Fourteen state legislatures have adjourned as of March 17. They are: Arizona, Arkansas, Georgia, Idaho, Indiana, Montana, North Dakota, Oregon, South Dakota, Tennessee, Utah, Washington, West Virginia, and Wyoming.

Constitutional amendments to prohibit diversion of highway user revenue received the attention of the legislatures of five of these states with Tennessee and Indiana enacting such legislation. South Dakota enacted favorable diversion legislation but not in the form of a constitutional amendment. West Virginia legislators enacted an extension of a temporary gasoline tax increase. No actual increase became law in the above 14 states.

Outmoded Laws Handicap to Public Works Projects

Postwar public works construction may be handicapped by outmoded laws in many states, it was warned by Federal Works Agency Administrator Philip B. Fleming in an address before the Municipal Forum of New York, a group of investment bankers.

General Fleming asserted that the

(Continued on page 276)

Measure the VALUE of "Hercules" (Red Strand) Wire Rope by what it will do

For the sake of both speed and economy, it is important to use materials and equipment of proven dependability.

For fifty-nine years "HERCULES" (Red-Strand) Wire Rope has been demonstrating its stamina and trustworthiness. Its record of consistent performance — day after day, and month after month — has made and held a host of loyal friends. Such performance is never a matter of chance, but the result of sound fundamental principles, experienced organization, and advanced manufacturing facilities.

Why not measure the ultimate value of "HERCULES" (Red-Strand) Wire Rope by the accurate yardstick of performance? You will quickly discover that its long life makes for more continuous production and lower operating cost, saving both time and money.

"HERCULES" (Red-Strand), Wire Rope is furnished in both Round Strand and Flattened Strand constructions — in either the Preformed or Non-Preformed types. In this one grade is a right rope for every heavy duty purpose.

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Highest Quality Lubricants—
Engineering aid...Tested maintenance
schedules, and many other
time-savers now combined into
ONE COMPLETE SERVICE for Contractors

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:
Magnolia Petroleum Co., General Petroleum Corp. of Calif.

SAVING TEAM

THIS complete lubrication service is made to order for the contractor swamped with jobs marked "RUSH." Here's how it helps you meet and beat urgent deadlines.

Whether you use 7 or 70 different types of machines, you get exactly the right oils and greases for *all* applications—even the most unusual ones. No more time wasted on special orders, follow-ups and extra bookkeeping.

Wherever your operations take you, we *schedule regular deliveries right on the job.* This helps you reduce inventory problems—minimizes out-of-service time for equipment—saves manhours.

The Socony-Vacuum Representative is always ready to cooperate with your men—to help educate "green" hands on where, when and how to lubricate each machine. He also brings you field-proved maintenance schedules—practical help with any "problem" equipment—and qualified engineering aid when needed.

Why be satisfied with fuels and lubricants, alone, when you can get complete contractor's service by specifying Socony-Vacuum products.

"ON YOUR STAFF—BUT NOT ON YOUR PAYROLL"
Your Socony-Vacuum Representative

CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE . . .
PLUS
1 ENGINEERING HELP on time-losing operating problems; 2 TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job;
3 PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

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LA CROSSE WISCONSIN

Shots from the Firing Line

(Continued from page 273)

laws applying to public works "constitute an accrete land down in piecemeal fashion over the years."

Declaring that most of the "forward-looking statutes" passed by the states during the depression period have expired by their own limitations, he added that to accrete in extent "we are now back in the dark ages of public works law."

Counties in many states lack legal authority even to build general hospitals, he said. Almost every project requires a special enabling act, he declared, with the result that public works law today represents "an encrustration of patchwork statutes, most of which were enacted to meet emergency situations rather than to provide for general and continuing needs."

The stockpile of completed public works plans, ready for contractors, is still far below the volume that may be needed, General Fleming said.

Georgia Lets Contracts for Highway Repair Project

With work to begin early in the summer, Georgia let contracts in late March for a $5,000,000 highway repair project —the third of a proposed five-year program to recondition war and age-worn highways.

Since the beginning of Gov. Ellis Arnall's administration, $8,500,000 has been spent on road repair—$3,500,000 in 1943 and $5,000,000 last year.

Idaho Needs More Money to Meet Federal Road Grants

Idaho's State Highway Director T. Matt Hally announced he had been advised by district and regional engineers of the Federal Public Roads Administration that Idaho definitely will need additional sources of revenue to participate in the federal-state postwar highway construction program.

Federal postwar highway construction legislation calls for Idaho to raise $3,000,000 yearly to match $5,000,000 of federal funds for the first three postwar years.

Gov. Charles C. Gossett asked the 1945 Idaho Legislature to provide needed additional revenue, but the legislature only passed a gasoline tax increase which will provide $800,000 additional each year.

OBITUARY

Charles Morton Clark

Charles Morton Clark, 72, who retired last January as chief engineer of the New York City Board of Water Supply, in which capacity he supervised construction of the $300,000,000 Delaware Aqueduct, died April 6 in a hospital at White Plains, N. Y.

Born in Potsdam, N. Y., Mr. Clark was graduated from the Potsdam Normal School at the age of 19. After teaching school for a short time at Goldens Bridge, N. Y., he went to work as a laborer for the old Croton Aqueduct Commission of New York, studying engineering at night through a correspondence course.

Following work on the construction of the Muscoot Dam in the Katonah division of the commission, he became an assistant engineer in 1905 on the construction of the Cross River Dam. In 1907 he joined the Board of Water Supply as an assistant engineer, later becoming division engineer in the Pleasantville area of the Catskill Aqueduct.

Mr. Clark began the boring of the Shandaken Tunnel, which is 18 miles long, in 1918, and then spent three years in charge of driving the southerly half of the tunnel. Made department engineer in 1921, he supervised construction of the additional steel pipe siphon, at Peekskill, needed to bring the Catskill Aqueduct to its full capacity.

In 1927, when the board undertook construction of a second tunnel to meet the growing problem of water distribution within New York City, Clark was placed in charge of this 20-mile long project.

Mr. Clark was named deputy chief engineer of the board in 1936 and chief engineer in 1940. Twelve large contracts for the construction of the Delaware Aqueduct, which had been awarded in 1938, had to be readjusted after the outbreak of war and the task of effecting agreements between New York officials and the contractors was assigned to Clark. His success in this work was regarded as remarkable as the building of the Aqueduct.

Surviving are his wife, Mrs. Grace Saul Clark; two sons, Horace N. of Bound Brook, N. J., and Charles K. Clark of Norristown, Pa.; two daughters, Mrs. Grace R. Wilson of Valley Forge, Pa., and Mrs. Elizabeth Collins of White Plains; a brother, Robert Y. Clark of White Plains, and a sister, Mrs. Mary Amos of Potsdam.

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"Collects and Controls"

Model IWD

1 Portable units operate through powerful air stream by an effective double separation principle. No dust escapes into the air. Reduces SILICOSIS hazard to safe hygienic limit.

2 When applied to rock drills, SPEEDS UP DRILLING TO 33 PERCENT. Drill steel cuts into fresh rock unimpeded by dust or chips. PROLONGS LIFE OF DRILL STEEL. REDUCES SHARPENING COSTS.

3 Quick detachable hood permits easy inspection of hole and changing drill steel without interference from hood.

4 When applied as industrial unit, collects dust accumulations that are costly and apt to be a hazard both to men and equipment. Keeps your plant, motors and machinery free from harmful dusts.

5 Equipped with Markley-Carter disposal container which permits continuous collection and disposal without closing down the system.

● Write for Bulletin 4432 which describes in detail the advantages of using MARKLEY-CARTER DUST COLLECTOR in your quarry and plant.

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A MACHINE for your particular project . . . that's what you get when Bucyrus-Erie builds YOUR hydraulic dredge. Thoroughly experienced dredge engineers work with you in an exhaustive study of the operating conditions to be met, work up the results of their research into a design which fits your particular needs completely. Conversion of this design into the finished machine combines the skilled workmanship developed in 60 years of manufacturing experience with the best available materials.

The result is a dredge which gives you the continuous and economical output you want for profitable operation . . . another example of the "years ahead" engineering which has long made Bucyrus-Eries, afloat and on land, the standard of excellence in excavators.

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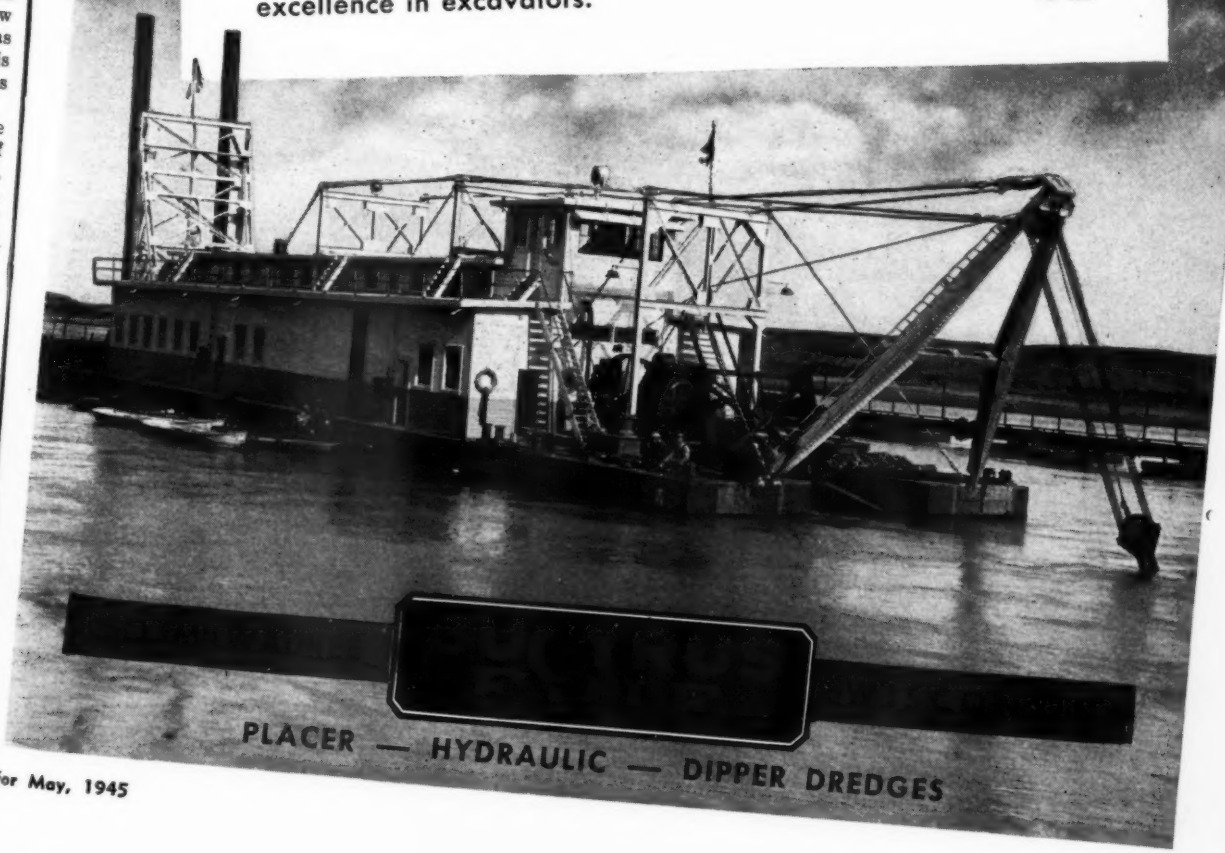

PLACER — HYDRAULIC — DIPPER DREDGES

NOT in the Contract

"Your leg is swollen," admitted the doctor, "but I wouldn't worry about it."

"Well, if your leg was swollen, I wouldn't worry about it either."

A young lawyer pleading his first case, had been retained by a farmer to prosecute a railway company for killing twenty-four hogs. He wanted to impress the jury with the magnitude of the injury.

"Twenty-four hogs, gentlemen! Twenty-four! Twice the number there are in the jury box."

Abie (moaning): "Oiy, Gevalt, I'm dying. Send for me a priest."

Son: "But, papa, for you a rabbi should come."

Abie: "Do as I'm telling you. Do you vant that I should be giving our goot rabbi small-pox?"

The council was discussing the type of milk which should be provided school children. To conclude the debate, the chairman rose to his feet. "Gentlemen," he declared, "what this town needs is a supply of clean, fresh milk, and the council should take the bull by the horns and demand it."

"Sorry, Soldier, but I never go out with perfect strangers."

"That's okay, Babe. I ain't perfect."

"Are you keeping a hope chest?"

"With a chest like mine, there is no hope."

First German Officer: "What do we do now? Retreat?"

Second German Officer: "Retreat? You must be mad. Germans never retreat. We must advance in the direction from which we came."

"This new ex-Seabee boss expects us to knock out a new airport here by next Wednesday!"

A man returning home after a few days' absence was met by his little boy:

"Papa, there's been a bogeyman in Mamma's bedroom."

"Oh, Johnnie, don't talk nonsense. You know there is no such thing as a bogeyman."

"Yes, there is too," Johnnie says. "And what's more, he's up there hiding in the closet right now!"

So the man goes upstairs, a little anxiously, and opens the closet door. Sure enough, there is his good friend Sam from Czechoslovakia.

"Why, Sam," he cries, almost bursting into tears. "How could you do this to me? Didn't I furnish your passage from Europe? Didn't I rescue you from the clutches of Adolph Hitler? And now you repay me by hiding in the closet and scaring my little boy!"

The average man shaving his beard every day removes a beard of about a sixty-fourth of an inch in length, at which rate he removes seventy-one yards of beard between the ages of twenty and sixty-five.

St. Louie Sue, who has been taking a Nurse's Aid course, says she is now so proficient that she can make the patient without disturbing the bed.

"Hello! Is this the city bridge department?"

"Yes. What can we do for you?"

"How many points do you get for a little slam?"

The regiment was trekking through the desert; it was arid and parched and not a drop of water was to be found. One recruit sat sadly on a stone, his head in his hands.

"What's the matter with him?" asked the sergeant.

"Homesickness," said Pvt. Smith.

"We've all got that."

"Yes, but his is worse than ours. His father owns a saloon."

The boat had just left Portland when a sprightly little flapper stowaway was discovered in a lifeboat. The captain ordered her sent to his cabin.

"I don't know what to do with you," he said as he questioned her.

"Say, skipper," she said finally, "how long have you been a sailor?"

Whatever trouble Adam had,
No man in days of yore
Could say when Adam told a joke:
"I've heard that one before."

It's easier to lift, lower, push or pull the Simplex Way!
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.

Surplus Equipment

(Continued from page 249)

9 Years 5
10 Years and older .....Scrap value

"4. The Government should dispose of used equipment at a predetermined date of release based on inventories of used and new surplus machines so that the market will not be flooded at any one time."

Disposal of Surplus Spare Parts

For the disposal of surplus spare parts the following five recommendations are made:

"1. If any equipment is left over from combat operations abroad and is to be used to pay damage claims of foreign Governments or their agencies, it is recommended that one year's supply of spare parts be sold and that these parts be furnished from U. S. military inventory. Distribution of these parts should be through manufacturers' regular distributing channels abroad for an administration fee of from 5 to 10 per cent.

"2. So-called 'machine sets' of spares should be offered with each new or used surplus machine which will be sold in the domestic market. These are emergency parts which can be carried with the machine and are useful on any operation.

"3. Every possible effort must be made by military agencies to reduce their presently large parts stocks by carefully screening their replenishment requisitions against existing depot inventories. It is only by most strenuous efforts along those lines that the problem of disposal of surplus parts at war's end can be reduced to manageable level.

"4. It should be left to the discretion of each manufacturer to negotiate with Government the terms under which he would be prepared to accept return of surplus spare parts at war's end.

"5. As guidance to Government for negotiating repurchase agreements with manufacturers, the following procedure is advocated:

"A. Surplus spare parts may be divided into two groups: the first group consists of outside purchased parts; the second group consists of parts produced by the manufacturer.

"B. Repurchase of outside purchased parts can be considered by the manufacturer only at the time when such stock will be offered for sale. If it then seems desirable to purchase any or all of these parts, one should do so, giving consideration to the possibility of feeding these parts back into production, provided, of course, that the manufacturer's product designs at that time permit doing so. The offer to Government for such outside purchased parts, in all probability, will have to be consistent with the offer being made by manufacturers on similar parts forming part of the termination inventories. If manu-

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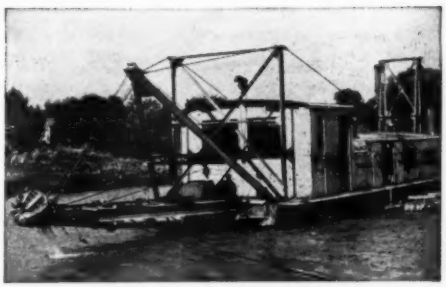
HYDRAULIC - DIPPER - CLAMSHELL

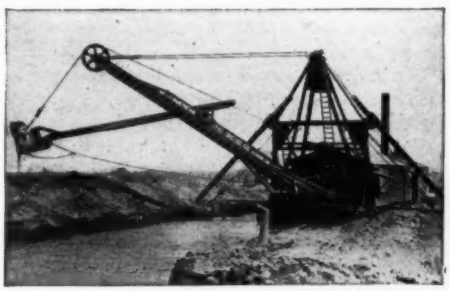
Complete integrated units, each designed for specific performance.

Bolted sectional steel hulls, power and pumping units, spuds, frames, ladder or booms are shipped by truck, rail and/or as hold cargo. May be easily assembled at inland site and dismantled for relocation after project is finished.

ASD dredges are backed by 40 years of dredge engineering and operating experience.



HYDRAULIC DREDGES
Sizes 8 inches up



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Write for catalog, photos and data sheets.

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facturer and Government cannot agree on repurchase terms regarding these parts, then Government should attempt to sell them back to the original manufacturers, who in all probability may have a broader application for these parts than the excavator manufacturer who originally supplied these parts to Government.

"C. Surplus spare parts produced by the manufacturer can be classified in three groups: first, demolition parts purchased by the military to rebuild machines badly damaged in combat; second, abnormal wear parts purchased on account of severe military usage; third, normal wear and tear parts.

"D. The parts belonging to the first two groups, namely, demolition parts and abnormal wear parts, have no resale value as spare or repair parts for manufacturers or dealers. They might be of value for assembly into the end product, and as in the case of outside purchased parts, manufacturers should give consideration to the possibility of feeding these parts back into production. If manufacturers should decline to repurchase these demolition and abnormal wear parts, there appears to exist no other useful purpose to which these parts could be put.

"E. Spare parts of the manufacturer's original make, belonging to the third group, namely, normal wear and tear parts, are of value both from a redistribution standpoint, as well as for assembly into the end product to be manufactured after the war. In order to determine the value to the manufacturer of those parts, consideration must be given to:

"The expense of freighting and handling these parts from Government's parts depots to manufacturer's own warehouses or dealer's stocks.

"The sales and administration expense of redistributing these parts.

"The expense of unabsorbed factory overhead, caused by manufacturer's inability to reproduce these parts until surplus parts are sold.

"The cost of unprocessing these parts.

"F. Inasmuch as quantities of these normal wear parts are in excess of normal distribution requirements, it is suggested that they be offered in quantities, which in value will not exceed 20 per cent of the value of current production of new spare and repair parts.

Surplus Disposal Aboard

For surplus property disposal abroad it is recommended "that Government conclude with the original U. S. manufacturer, or his authorized representatives abroad, or both, agency agreements patterned after the agreements which will apply with respect to surplus disposal in the domestic market. In any event, every effort must be made to maintain the customary channels of trade, and wherever authorized manufacturers' representatives abroad can handle surplus war property in accordance with the overall policies and regulations of the Surplus War Property Act, arrangements should be made for them to do so.

"When the Government disposal agency abroad sells surplus without previous knowledge of the manufacturer, the disposal agency should supply the manufacturer with serial number of machines, name and location of purchaser, so that the manufacturer has the opportunity to service the equipment in the future.

Industry Advisory Committees

Although under both the original House and Senate bills provision was made for the organizing of Industry Advisory Committees to furnish advice with respect to the disposition of various classes of surplus property, the Surplus Property Act of 1944 makes no provision directing the organization of Industry Advisory Committees.

The Power Crane and Shovel Association holds that each industry group has a separate and distinct problem confronting it in the method of disposal of surplus property. The Association contends that a plan that suits one group works a hardship on another and that therefore the Surplus Act should be amended to permit the establishment of Advisory Committees and also grant immunity through legislation to such advisory committees from prosecution under the Antitrust laws, provided all community activity is limited strictly to activities permitted under the provisions of Federal Antitrust statutes.

Members of the Power Crane and Shovel Association are Bay City Shovels, Inc., The Browning Crane & Shovel Company, The Buckeye Traction Ditcher Company, Bucyrus-Erie Company, The Byers Machine Company, Harnishfeger Corporation, Insley Manufacturing Corporation, Koehring Company, Lima Locomotive Works, Inc., Link-Belt Speeder Corporation, Manitowoc Engineering Works, The Osgood Company, "Quick-Way" Truck Shovel Company, Sargent Machine Company, The Thew Shovel Company and the Unit Crane and Shovel Corporation.

With the Wonder Boys

(Continued from page 248)

since this last job set some rust up on the big brake drums, too, but Charlie is working this out gradually. The control room in the Monighan is strong with the heat being dissipated from the brake drums. The rims of the drums are criss-crossed with air fins to help cool them, and since these are an integral part of the brake drum you notice them and mark them down in your mind. This is but an example of an "extra" to take care of an abnormal job condition, and you begin to see that some of the credit for the Seabee legend goes to the machines they use: excavators, tractors, road

When the Contract Calls for SPEED

be sure your BUCKETS are Right

For rehandling, excavating or dredging Blaw-Knox builds buckets that get the most work done with the least crane time. They're safe, long lasting and easy on wire rope. For comprehensive data on the complete line of Blaw-Knox Buckets, write today for Catalog 2002.

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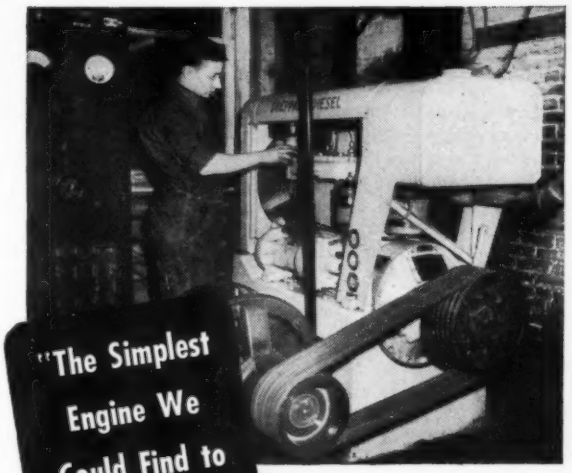

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"Power for the entire machine shop of Henry Riehl & Son of Philadelphia, Pennsylvania, is supplied by one Model #6 25-horsepower, Sheppard Diesel which was installed in June, 1941, and has been running nine hours a day, six days a week, ever since. The company manufactures narrow fabric textile machinery, working in both metal and wood. The various machine shops are housed in several adjoining buildings and on several floors, and contain both standard and special woodworking machines as well as a completely equipped machine shop. There is a total of eighty machines, the power for all of which is supplied by the Sheppard Diesel. (Note: The machines are never all in operation at the same time.) The Sheppard Diesel was chosen because, in the words of Theodore H. Wagner, one of the partners in the firm, 'it was the simplest engine we could find that would do the work.' Moreover, their own employees are able to fix minor troubles when and if they arise, without the necessity of calling in experts for maintenance work.

"Dependability, cheapness of power, low maintenance cost and quick starting, with power available when needed and shut off when not needed, were the characteristics required by Henry Riehl & Son, and the Sheppard Diesel amply fills these requirements. No other engine was previously used for power, and commercial power could readily be bought, but at greatly increased cost. Figures are not available to demonstrate accurately the savings that have been realized, but Mr. Wagner states that 'the Sheppard Diesel has paid for itself in the time we have had it.' When asked the opinion of the plant management concerning the performance of this engine, Mr. Wagner said, 'we think so much of it that we're going to order a larger unit.' He had particular praise for the efficiency and promptness of the Service Department of R. H. Sheppard Company.

"Last December the engine was overhauled, after three and a half years of service, and is now in new working condition. Apart from this overhaul, there has been no major expense for maintenance or repair."

Your priority may entitle *you* to a Diesel right now. Do as Riehl did—specify Sheppard and let the Diesel pay for itself. Write today for free bulletins and advice about obtaining WPB approval.

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rollers, concrete mixers and Bull-graders.

The forward targets set up by the survey party are awash at high tide, and you hope they stay in so you can keep on digging. A shuttleboat races by, throwing up a big wave across the white diamond-shaped target. For a minute you don't expect it to stay there, but after the boat goes by you've still got something out there to dig by.

After an hour, Charlie gets the first compartment filled and you've got to get up to help move the scow back. Charlie lowers an empty bucket in the empty compartment forward and booms to starboard very gently. You help Gallagher and Fink slack the spring line and take up on the other two. There's an electrically-powered winch to do this work ordinarily, at no loss of digging time, but the 25 horsepower electric motor is down and you know Grover is trying desperately to get it fixed. Moving the scow back this way is slow, and you know it costs something in the way of sacrificed digging time.

Digging Time Study

So out of sheer boredom, while you're sitting around watching the digging cycle, you run a little time study for your own information. Here is what you jot down for the next hour:

Start Cycle	Dump	Bucket Characteristic	Cycle Time
12:50	12:51½	Heaped	1.5
12:58	12:59½	Half full	1.5
12:59½	1:01½	Half full	2.0
1:01½	1:03	Full	1.5
1:03	1:04½	Heaped	1.5
1:04½	1:06	Heaped	1.5
1:06	1:07½	Heaped	1.5
1:07½	1:09	Half	1.5
1:18½	1:20	Half	1.5
1:20	1:21½	Heaped	1.5
1:21½	1:23	Heaped	1.5
1:23	1:24½	Heaped	1.5
1:24½	1:26	Heaped	1.5
1:26	1:27½	Level full	1.5
1:27½	1:29	Heaped	1.5
1:29	1:30½	¾ full	1.5
1:30½	1:32	Heaped	1.5
1:32	1:33½	Heaped	1.5
1:33½	1:35½	Heaped	2.0
1:35½	1:37½	Heaped	2.0
1:41½	1:43	Heaped	1.5
1:43	1:44½	Heaped	1.5
1:44½	1:46	Heaped	1.5
1:46	1:47½	Heaped	1.5
1:47½	1:49½	Heaped	1.5

Total cycles in one hour at –80 foot depth 25

Total cubic yards dug in one hour 141

The time study revealed three delays: adjusting scow lines, moving scow astern five feet, and moving dredge up.

Being an excavating man, a little study of this hour's performance offers some interesting possibilities. We find, for instance, an avoidable delay of nine and one-half minutes while moving the scow. Translated into the profit and loss language of an earth-mover, this means six cycles lost per hour. Estimating each bucketful at five yards, this represents 30 cu. yds. an hour lost. 240 yards a shift, 720 yards a day. 21,600 cu. yds. a month. Cripes, this is awful!

"Hey, Chief," you yell at Grover, "do you realize what that broken down scow engine is costing you in the way of production?"

"Hell, yes," he comes back at you in that easy way of his. "I've ordered parts to fix the motor.

"In the meantime, we've got to do the best we can with what we've got. We're losing some production, sure. But that's the real disadvantage of working 5000 miles from the United States."

Repairing Dog on Drum

This is driven home to you again while you're out on the YD-69. Smith

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For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—
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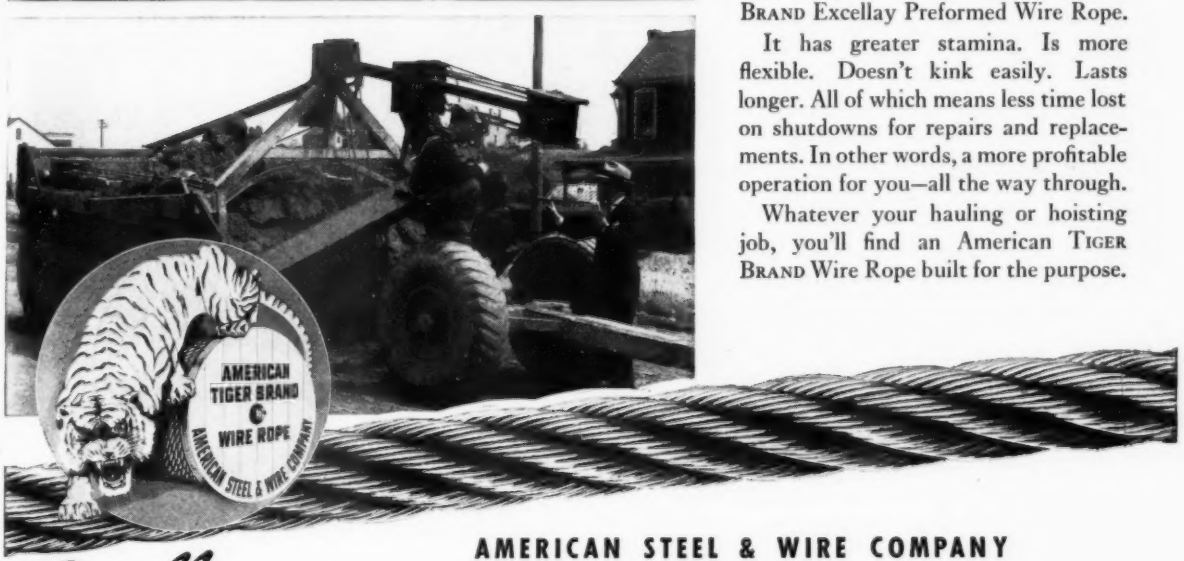
LET American TIGER BRAND Excellay Preformed Wire Rope be a factor in reducing your dirt-moving costs.

For example, in scraper wagons rigged as the one shown here, flexibility, abrasion resistance, strength and ruggedness are the requisites for satisfactory service. American TIGER BRAND fills the bill.

Actual on-the-job comparisons by contractors and engineers prove the superiority of U·S·S American TIGER BRAND Excellay Preformed Wire Rope.

It has greater stamina. Is more flexible. Doesn't kink easily. Lasts longer. All of which means less time lost on shutdowns for repairs and replacements. In other words, a more profitable operation for you—all the way through.

Whatever your hauling or hoisting job, you'll find an American TIGER BRAND Wire Rope built for the purpose.



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U·S·S American TIGER BRAND Wire Rope

is taking up on the stern lines, hoping his 6000 pound anchors will hold in the mud. A dog on the main drum, crystallized from long use, snaps in two. They radio a message out to the mobile repair barge which stands ready 24 hours a day to service the machines in your Battalion. In ten minutes the small barge, driven by self contained Murray & Tregurtha outboard engines, ties alongside. "Robbie" Robertson from Los Angeles takes a look and gives orders to remove the broken dog. With a piece of white chalk he quickly sketches an outline freehand on a piece of ¾-inch plate stock. A welder burns the new dog out, dips it down in the clear blue water (amazingly so, considering the dredging you've been watching), and hammers the slag off. Robbie fits it on the drum and locates the spot where the hole must go to accommodate the dog pin.

They give the dog one more fitting, trim it up, and remove the wood blocking they've used to hold the drum. It has taken 55 minutes by your watch. Without any fanfare, these men have fixed a broken part in amazingly short order. You begin to realize all at once that these are nothing but ordinary construction men, damn good ones; men who can DO things with their hands. Robbie is gray-haired, mighty close to the age limit, and just a little bit stove up with 35 years on excavating jobs. It shows in his walk, just a bit stiff, when he gets on the barge and takes out for another spot repair job.

Wetherall starts digging again. The shift is going fast, and a tension is beginning to grip everybody now. Will they fill the scow this shift? Charlie ought to make it, if our paper work is right. Everybody is pulling for him now, and he is digging one cycle after another. The seat behind his back is rubbing it raw, because Wetherall is getting yardage out of this machine to prove it'll produce even in 80 feet of underwater digging.

A good hour before quitting time he blows four long whistles. That's the signal for the self-propelled anchor scow, fitted with wood towing knees, to come in and take the scow out to the dump. It comes in, makes up tow, and gets away with Mitchell standing ready to knock the dump door dogs loose. It isn't but 500 feet out to water 120 feet deep. They crack the forward compartment first and work toward the stern without ever stopping the tow. It doesn't take but 20 minutes to dump and get back to the rig.

Charlie gets the first compartment half filled again before the LCVP heads in to relieve you. When the relief steps on the barge you're suddenly dog-tired and ready to call it a day. This tropical heat does something to a working man. Even though you haven't worked very hard physically, you feel proud you accomplished what you did. To the good-natured raillery between the crew coming on and your own watch, you can reply with pride, "Well, we got 700 yards!"

Meditating on this while you watch the green hills fade a little from view as you head back out to your ship, you realize that the Bucyrus-Monighan 5-W is averaging close to 150 cu. yds. an hour for every hour she digs. Daily production reports show yardages from 1800 to 2500 in 24 hours. Not good, but definitely not bad. Considering the disadvantages, it's good.

The crew is kidding each other, but underneath it all you suddenly see the terrible loneliness of men long overseas.

"God, I hope there's some mail tonight." They look at you and grin, and you're happy as hell you spent this day the way you did, because you were among the nicest, most remarkable bunch of workers the world has ever seen: not only United States Navy Seabees but you were with construction men as well. Builders and fighters.

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You can make additions and alterations rapidly . . . move it to a new location with 100% salvage. Factory assembly assures correct alignment in erection—reduces belt wear and maintenance expense. Write for Catalog 76. Barber-Greene Company, Aurora, Illinois.

Barber B G Greene

Constant Flow Equipment

Accident Prevention

(Continued from page 252)

Safety engineering and accident prevention based on the life of individual contracts can attain only a fraction of its effectiveness and will more or less resolve into mere routine inspection, lacking the fundamentals of coordination with design and plans, prework and pre-job planning and correlation with operations.

6. Every contractor should provide safety training for operating supervisors and foremen, with a condensed form for the smaller companies and more formalized for the larger.

Our study of 18,000 accidents indicated failure of supervision as related to the causes of accidents in 73% of the cases. As the direct representatives of management, supervisors most certainly are responsible key officials and there is no excuse for failure to properly provide them with adequate information and instruction concerning their responsibility and the mechanics of job safety.

7. Safety engineering and accident prevention techniques and principles must be integrated with operations and not super-imposed upon or conducted parallel thereto.

Responsibility for accident prevention will not be accepted by supervisors if the program is maintained by the safety department as a separate activity alongside of operations and not completely dovetailed therewith. Neither can the safety engineer impose his techniques upon the foremen and then toss the responsibility off of his shoulders onto those of the foremen. Accident prevention must be an integral part of every work assignment with the ultimate objective of every worker developing a skill in coping with hazards equal to that of his craftsmanship.

One of the principal functions of the construction safety engineer is to assist the operating specialists in determining the physical conditions and operating practices involving accident hazards, and the necessary planning for their correction. That this should include inspection of the site, material, plant and equipment is obvious; but of even more importance is an accurate appraisal of the attitudes and skills of the working force in order that assignment, instruction, training and discipline may be most effective.

8. The industry must have a plan for placing handicapped veterans in jobs they can perform.

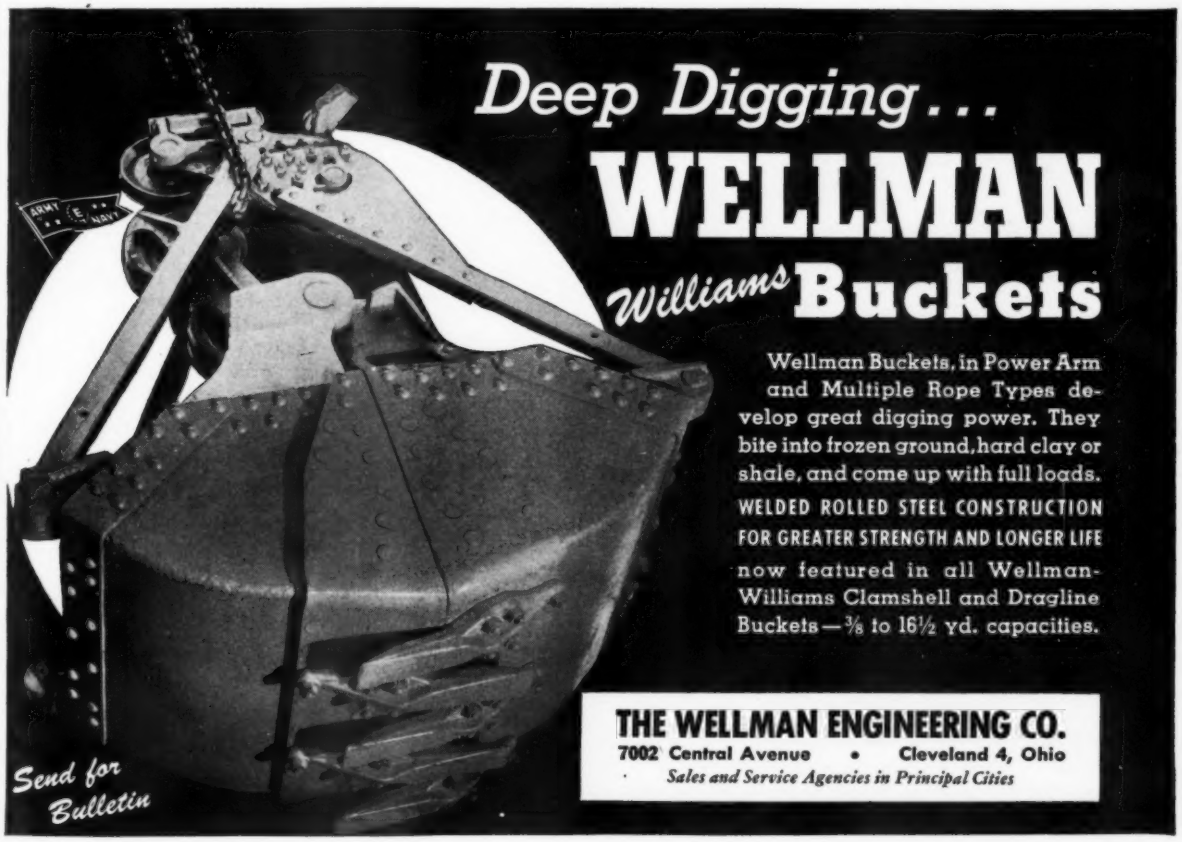
Construction work is considered highly suitable as a post-war medium for employment of returned soldiers and the demand will probably be heavy. Placing the veteran with no handicap will be a simple matter, but those with handicaps will have to be placed in accordance with their limitations in order that they be neither a hazard to themselves or their associates. This will involve detailed analysis of the requirements of each job.

9. The industry must demand more "built-in safety" from the manufacturers of construction equipment.

The most serious phase of the construction accident problem is that of the use and operation of construction equipment. Our analysis of 36,000 accidents shows that 25% involved equipment and resulted in 42% of the lost time from all accidents. Many of the accidents were traced to faulty design, others from failure to incorporate safety features into operation or use. Lack of adequate vision for tractor operators, no adequate warning devices, lack of self-starters for diesel engined tractors, no built-in protection on dump trucks for service men working under raised bodies, are but a few illustrations. The manufacturers will certainly respect the demands of its customers.

10. Every contractor must have a pre-job and pre-work plan.

The pre-project plan includes location of borrow pits, batch plants, ag-


Deep Digging...
WELLMAN
Williams Buckets
Wellman Buckets, in Power Arm and Multiple Rope Types develop great digging power. They bite into frozen ground, hard clay or shale, and come up with full loads.
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gregate mixers and equipment service and repair units, with a traffic routing and control plan coordinated with all operations. Proper location of lumber storage, scheduling of materials to provide for sequential operations, parking and traffic control of employees' vehicles, control plan for all blasting operations and similar problems are instances where orderly advance planning produces a maximum of safety instead of confusion and catastrophe.

As work on a project progresses, every special job involving more than routine problems should be planned in advance through coordination of safety engineering, design and operations; for example, erection of unusually long and heavy trusses, lifting, moving and setting such objects as heavy and bulky tanks, special jacking operations, railroad operations, unusual excavations, special cribbing and false work and similar items.

Three of the four major catastrophes which have occurred on work under the jurisdiction of the Corps of Engineers resulted in 23 fatalities and all could have been prevented by specifically planning the jobs in advance.

I am aware that deliberately calculated risks are frequently taken in construction work, such as overloading cranes and hoists when inadequate advance planning failed to provide sufficient equipment, operating equipment with no factor of safety and similar instances. Never can this be justified as good management, nor can management suspend their moral and legal obligations in these practices when the safety of their workers is so jeopardized.

At Crossroads

The construction industry is at a crossroads — it has participated in and contributed to the greatest accident prevention achievement in the history of the safety movement — it can return to its medieval fatalism that accidents are inevitable, to the stigma of defeatism, to the shallow doctrine of take a chance with the ever increasing burden of accident costs and consequences or it can apply the experience of the past four years and through voluntary, intelligent and aggressive leadership, produce a cohesive, concerted and everlasting determination to make construction work as safe as the steel mills and foundries, the TNT and dynamite plants, and take the place in safety that befits the great industry it is.

MEMO
TO ALL CONSTRUCTION SUPTS.:—
Have we been taking "BUCKETS" too much for granted?
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Battle at Asan Point

(Continued from page 256)

by either the tractor operators or the shovel oilers. Sometimes a bulldozer would have to pull the grease truck in and help it out, but the equipment got serviced once a shift and was never down for lack of it.

Production Statistics

Asan Point contained 200,000 cu. yds. of excavation . . . 100,000 cu. yds. of that total had to be drilled and shot. Seventy-five thousand cu. yds. were taken out by the shovel dipper or rooted loose to save powder and removed by tractors and scrapers. Less than 25,000 cu. yds. could possibly be classed as common excavation. This job was only a small part of a big highway job, but except for a hard rock point less than half as big this job was the toughest. Gouging at Asan Point with two-year old equipment, fighting rain, mosquitoes and tropical heat, the Seabees leveled Asan Hill and got it finished before the road schedule caught up. Black top was going in about a mile away when the Seabee surveyor looked down the barrel of his level the final time and said, "Well, I guess she's ready."

Work was carried on seven days a week, and even the idle hours between 2 and 6 a.m. were utilized for servicing equipment and making spot repairs. With their eyes turned to the east, and home, the Seabees lived the roughest kind of life, ate K-rations out of cans, and washed the rock dust out of their beards in a battle helmet when they were too tired to shave. The day the job was visited for Excavating Engineer somebody brought out a hot lunch at noon: slabs of Spam, bread, and spinach. You don't like that? One Seabee slapped some spinach on his Spam and chortled, "They're really puttin' on the dog today; wonder what's up?"

How in the hell can you beat a bunch of guys like that?

Extending a Dredge

(Continued from page 253)

from 75 feet to 125 feet in length by being cut apart and having a section inserted. Five buoyancy tanks were built into the ladder to provide additional lift. The "A" frame supporting the ladder hoisting tackle was lengthened 15 feet because of the increased length of the ladder.

In order to work at the maximum depth, the angle of the digging ladder with the horizontal was increased to 60 degrees. Work on the digging ladder was done on a shipbuilding slip

(Continued on page 288)

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

FOR SALE

Northwest 105 backhoe with crane, boom and extensions, fairlead, clamshell. Overhauled and guaranteed condition.

W. Bancroft
3211 Hazel St. Erie, Pennsylvania

One Model 50-B Bucyrus-Erie Steam Dragline including 60' boom, 1½ cu. yd. bucket, shop number 9691, new 1928. Boiler needs refluing. Box 3095

3-yard Hi-lift shovel attachment for Lima 1201, excellent condition.
P&H Model 600 1¼-yard crane with shovel and dragline attachments, overhauled.
Northwest Model 104 crane-dragline, excellent condition.
4—¾- to 1½-yard dragline buckets, Hendrix and Page.
5—Owen rehandler clamshell buckets 1½-yard to 3-yard.

CONSTRUCTION EQUIP. CORP.
2404 W. Clybourn St. Milwaukee 3, Wis.

50-B Electric Dragline No. 5084, 60 cycle, 3 phase, 440 volt. 60' boom; 1½ yd. bucket. Near Chicago. Available immediately. Box 3096

FOR SALE

1½-yard shovel dragline-combination. Dragline buckets—1-yd. and 1¾-yds. Box 3101

FOR SALE OR RENT

SHOVELS, CRANES, DRAGLINES, ETC.
Capacity to 3 cu. yds. Cranes to 50 tons
Ten 17 FDT Bottom Dump EUCLIDS.
Six 6 FDT Bottom Dump EUCLIDS.

FORBON EQUIPMENT CO.
280 Gorge Road, Cliffside Park, N. J.

One Model 101 Lima 1¼ cu. yd. shovel, shop No. 110 powered with Waukesha gasoline engine. Box 3103

Bucyrus-Erie 43-B diesel dragline equipped with 60' boom, D-13000 Caterpillar engine and 1½ cu. yd. dragline bucket. Good condition. Located Oregon. Box 3108

Diesel dragline on trucks, 3 yd. RC bucket, 110' boom. Rebuilt 1944, all in A-1 shape.
Monighan 3 yd. dragline, 225 HP Cummins eng.
2 yd. Diesel Cat. crane-drag, 75' boom.
Elec. drags.—3 yd. walker; 4 yd. on cats.
Elec. Cat. shovels—¾, 1¼, 1½, 2½ and 4 yd.
Electric Hoist—75 HP, AC, 3 drum. Like new.
105 NW crane-dragline; 1 yd. crane, 50' bm.
Cat. 50 Diesel tractor with hydraulic dozer.
Angledozer and front end loader for Cat. D8.

James Wood, 53 W. Jackson, Chicago 4, Ill.

1—Hercules JXA, 6 cylinder 3⅜" x 4½" gasoline engine; hand starting equipment. Complete with all accessories except radiator. Located Chicago. Box 3094

FOR SALE

Koehring Model 1-2A, ¾-yard clamshell crane equipped with 65' boom and Wisconsin 4 cylinder 5" x 6" BAU engine. Completely rebuilt and guaranteed.

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FOR SALE

One Industrial steam locomotive crane.
One 1 cu. yd. Northwest combination crane and shovel.
One 1 cu. yd. Northwest electric shovel.
One American twin drum dragline hoist, 60 HP Waukesha motor.
One 50-ton steel bin.
One 8x36 Hi-Way portable self-propelled crushing plant, 100 HP Waukesha motor.
125 HP Waukesha power unit, clutch and pulley.
One 10x36 Pioneer crushing plant with rolls and conveyors.
One model K-1 'Link-Belt crane, 50 ft. boom, clam and dragline buckets—1 cu. yd.

Box 3105

FOR SALE

Bucyrus-Erie 37-B shovel front in good condition; price $2500. Contact
Clearwater Sand & Gravel Co.
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2—¾ cu. yd. Skimmer Scoop Dipper—10-B.
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1—1¼ cu. yd. Cast Front Dipper—GA-3.
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1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2¼ cu. yd. Inserted Type—55-B.
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1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.

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Write for any further information desired.

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

Used contractors' equipment including: 1 Caterpillar tractor; 5 scrapers; 1 grader; 1 steam hammer; 1 model 372 Marion shovel; 1½-yd. dipper; 5-yd. dragline bucket; 3 air compressors; 1 blower; 1 grout mixer; ventilating pipe; 1 single drum mine hoist; 7 light plants; 2 International 100 H.P. 60 KUA generator sets; 160 H.P. Waukesha gas power unit.

Above equipment is located in Middle West and is offered subject to prior sale.

Box 3107

Class 14 Dragline No. 3562. Steam power. Caterpillar mounted. 70' boom; 2 yd. bucket. Located near Chicago. Available immediately. Box 3097

FOR SALE

Allis-Chalmers Roll Crusher type XX Size 52"x24"; weight 142,000 lbs.; shaft and ccre only 18,800 lbs; swivel head 11,250 lbs.; base 29,000 lbs.; large pulley 19,000 lbs.; small pulley 4,000 lbs. Cost new $21,250. Condition good with exception two spokes broken in large pulley 22"x10' but repaired. Have half section of spare pulley in good shape. Other section of this spare has broken spoke but is repaired. Small pulley is 14"x4'. Address inquiries to:

F. W. Evans Mines
301½ Joplin Street Joplin, Missouri

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100-B Dippers
One 2-½-cu. yd. cast manganese steel dipper, complete with bail and teeth.
One 3-cu. yd. Mesabi Vanderhoef dipper complete with bail and teeth.

Excellent Condition
Box No. 3087

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Kentucky Clay Mining Co.

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Four E-12 Athey crawler wagons with brand new 20-ton Athey tracks, pads, wheels and axles, or will sell tracks without the wagons.

EDWARD E. MORGAN CO., INC.
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1—B-E elec. class 14 dragline, caterpillar traction. 62 ft. boom and 14 ft. extension. 3 cu. yd. Page bucket. Ser. No. 3545. Excellent condition. $2000.00 new parts. —$19,000.00.
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1—B-E 10-B ¾ yd. shovel-dragline combination. Extra new repair parts. New 1939. Excellent condition.
2—Ingersoll-Rand wagon drills, late model D-2 with X-71 drill, pneumatic hoist, 10 ft. changes. Reconditioned. $750.00 each.
1—Page diesel walking dragline No. 429. New engine. 60 ft. boom, 2 cu. yd. dragline bucket. $13,500.00.

M. Wenzel
2136 Jefferson Kansas City, Missouri

Three Bucyrus-Erie 3-yd. electric draglines, 3/60/440, caterpillar traction, Page buckets. Can convert to Diesel. Excellent for coal stripping.

Construction & Power Machinery, Inc.
270 - 23rd St., Brooklyn, N. Y., Tel. So. 8-4900

FOR RENT

½-yard truck crane, Int'l. TD-18 with Bucyrus-Erie dozer, T-20 tractor, 101 Galion Patrol. Box 3102

FOR RENT

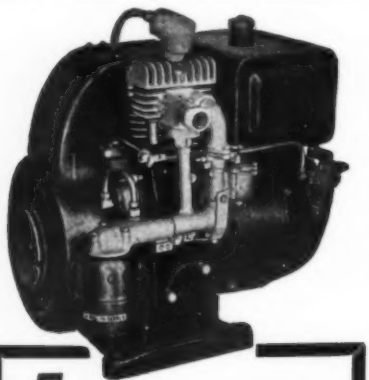
2 yard Dragline. Box 3100

WANTED

Two experienced highway engineers seek backing for airport, highway and sewer work. Equipment and jobs available. Silent or working partnership agreeable.
Box 3099

Wanted to Buy
Shovel front for P&H Model 255
Spencer Construction Company
Carrollton, Texas

SHOVEL FRONT FOR OSGOOD STEAM SHOVEL 29
Hugo Neu
31 Nassau St. New York 5, New York



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WANTED
15x30 or 18x36 jaw crusher.
Late model bulldozer 7 to 10 ton.
150 to 200 ton hydraulic press.
Late model ½ or ¾ shovel.
Small Caterpillar tractor. Box 3106

Trackson Traxcavator or Highlift with Caterpillar T4 or T2 gas or diesel tractor.
GEORGE F. OHLFS
419 West Miner Ave. Ladysmith, Wis.

WANTED
Three D-8 Caterpillar tractors in the 1H900 series with or without double drum PCUs and bulldozers.
One late model D-6 Caterpillar tractor.
Box 3092

Shovel attachment complete to mount on Bucyrus-Erie Model 10-30 dragline, serial 9771.
Box 3104

WANTED
1½-yd. gas or diesel shovel-dragline.
2 to 2½-yd. crane or dragline. Box 3082

POSITIONS WANTED

Position as operator on 750-B electric with 15 years operating experience. Also experience on 85-B and others. Age 50. Can give reference. Available on short notice. Box 9242

Dragline operator with 27 years' experience on various machines. Familiar with Bucyrus-Erie equipment. Good on repairs. 52 years old; good health. Married. Box 9241

Extending a Dredge

(Continued from page 286)

and when completed the ladder was launched by being pulled to the end of the ground ways and floated off at high tide. Temporary buoyancy tanks had been mounted on the cutter end of the ladder to keep even trim while afloat.

The hull of the dredge was put on prepared greased skids in a dry dock, cut in two, and the two sections pulled apart. The new intervening sections were lowered into place, thus lengthening the hull by 40 feet, then welded in place. Strengthening plates were riveted to the deck and bottom shell.

Because the depth of water was too great for the use of spuds, a new three-way anchoring arrangement was used.

The cutter drive gear was moved to a new position on the hull end of the ladder, with the 20-inch discharge pipe leading astern on the deck of the dredge and onto pontoons.

The "Papoose" started work on January 4, a total of 51 days after it entered the shipyard for alterations. After six weeks of operation, with no mechanical breakdowns, it averaged 11,000 yards of solids per day. The dredge is now working on the second cut to the 85-ft. level. A third cut will be made at 100 feet.

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